

Excalibur™ Multirate DAP

Installation and Operation

15D09B-1/D 6/95

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About This Manual

Manual Description

This Excalibur Multirate DAP (Digital Access Product) Installation and Operation manual provides the information you need to properly install, operate, and troubleshoot this DAP. It has been written with the assumption that you are familiar with basic data communications principles and terminology.

The manual is composed of the following chapters:

- **Chapter 1, "Introduction"** contains an overview of the DAP's capabilities and descriptions of all standard features and options.
- **Chapter 2, "Operating Modes"** provides information about each operating mode and how it functions. It includes a detailed description of secondary channel operation, Analog, Switched 56, and ISDN integral dial backup operation, and asynchronous/synchronous conversion.
- **Chapter 3, "Installing the DAP"** shows you how to place the unit, make the necessary cable connections, set the jumpers, and provide AC power.
- **Chapter 4, "Using the Front Panel"** describes how to use the front panel buttons and LCD screen to move through the menus and enter commands. It also explains how to establish password protection and how to control remotely located DAPs from the local front panel.
- **Chapter 5, "Defining Operating Parameters"** explains how to configure the DAP so that it will perform properly in your particular network environment. This chapter includes descriptions of each operating parameter and recommended settings for typical applications.
- **Chapter 6, "On-Line Operation"** describes the procedures you can perform while the DAP is transmitting and receiving data. These procedures include monitoring current operating status, establishing dial backup connections, and sending call messages.
- **Chapter 7, "Troubleshooting"** explains how to use the DAP's built-in diagnostic tests to isolate the source of malfunctions in your network.
- **Appendix A, "Technical Specifications"**
- **Appendix B, "ISDN Service Ordering Checklist"**
- **Appendix C, "Quick Reference Menu Flowchart"**

Terminology and Conventions

The following typographical conventions are used in this manual:

- References to labeled parts of a device, such as buttons and connectors, are shown in **boldface**. For example:

The **DL** connector is located on the DAP's rear panel.

- References to text that appears on the control panel LCD screen are shown in `this font`. For example:

Press the button beneath `Serve` to enter the Service menu.

- In the front panel illustrations that accompany step-by-step instructions, the gray shading indicates which button to press. For example:

- Press the button beneath `Serve`.

<div> <div>T</div> <div>Excalibur DAP</div> <div>Local Remot Addr s Serve ></div> <div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> </div> </div>				Escape	Top
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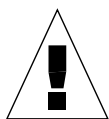
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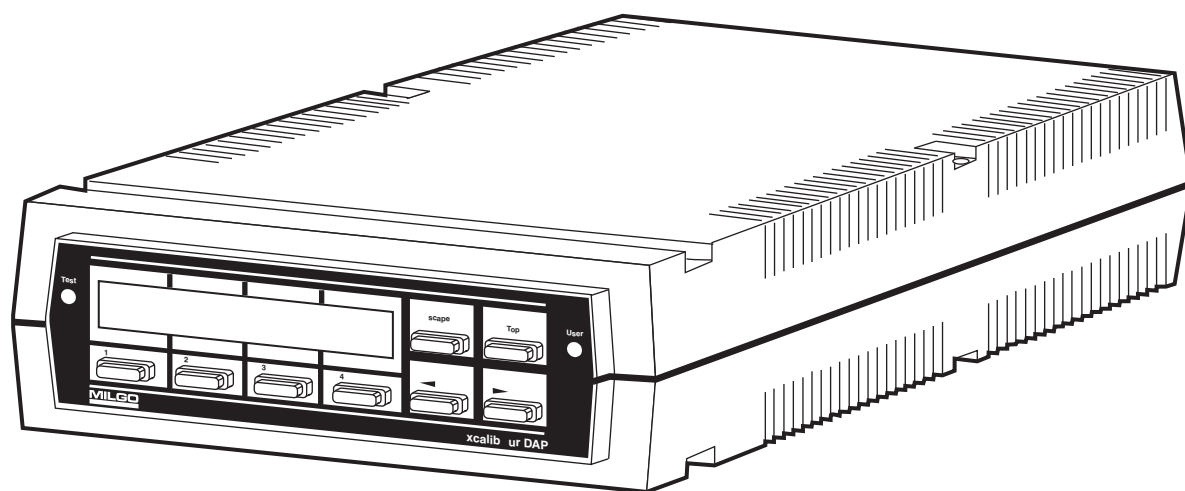
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Important Safety Instructions

1. Never install telephone wiring during a lightning storm.
2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.
5. Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
6. Do not use the telephone to report a gas leak in the vicinity of the leak.



Caution: To ensure compliance with government regulations, do not install or operate this product until you have read the information contained in Appendix D.



Excalibur Multirate DAP

Chapter 1

Introduction

Introducing the Excalibur Multirate DAP

The Excalibur[™] Multirate DAP (Digital Access Product) provides a versatile interface between your data terminal equipment (DTE) and all the digital data services. Efficient and economical performance is provided in both point-to-point and multipoint network configurations. The DAP operates at digital line speeds of 2.4, 4.8, 9.6, 19.2, 56, and 64 Kbps.

DAP control is quick and easy with the Excalibur Multirate DAP's menu-driven front panel display. Clear English prompts displayed on a 48-character LCD screen guide you through each operating procedure. To enter a command, simply press the button beneath the desired menu option.

With the Excalibur Multirate DAP, you can control any remote Excalibur DAP in the network from the local DAP's front panel. By entering the remote unit's address into the local DAP, you can perform operating procedures as if you were at that site. This feature eliminates the need to have trained operators at remote sites.

For even more comprehensive network control, the Excalibur Multirate DAP can operate with one of Milgo's Communications Management Series (CMS[™]) network management systems. A CMS system provides sophisticated data base management, performance analysis, fault isolation, and network restoral capabilities.

Operating Modes

There are six operating modes for the Excalibur Multirate DAP:

- Interruptive Secondary Channel (Basic DDS[®]) - provides an interruptive secondary channel for diagnostic testing. Data transfer between the DTE and the Digital Data Service (DDS) network is interrupted when the secondary channel is in use.
- Non-Interruptive Secondary Channel (DDS-SC) - provides an out-of-band secondary channel supplied by the DDS-SC service which can be used as a noninterruptive secondary channel or as a clear secondary channel for user applications. The DDS network allows additional bandwidth for the secondary channel and does not interrupt primary channel data.
- Non-Interruptive Secondary Channel (Basic DDS) - provides a non-interruptive secondary channel or a clear secondary channel over basic DDS lines in exchange for a small amount of bandwidth.

- Clear Channel 64 Kbps - operates on the Clear Channel 64 Kbps service offered by Accunet Spectrum of Digital Services (ASDS®) and provides 64 Kbps to use for data. An interruptive secondary channel is provided. When the secondary channel is in use, 57.6 Kbps is available for data.
- Non-Interruptive Clear Channel 64 Kbps - provides a non-interruptive secondary channel or a clear secondary channel over the Clear Channel 64 Kbps service in exchange for a small amount of bandwidth.
- Customer owned copper wire (LDM) - provides short-haul point-to-point limited distance communications capabilities and a non-interruptive secondary channel.

Figure 1-1 shows typical Excalibur Multirate DAP multimode applications.

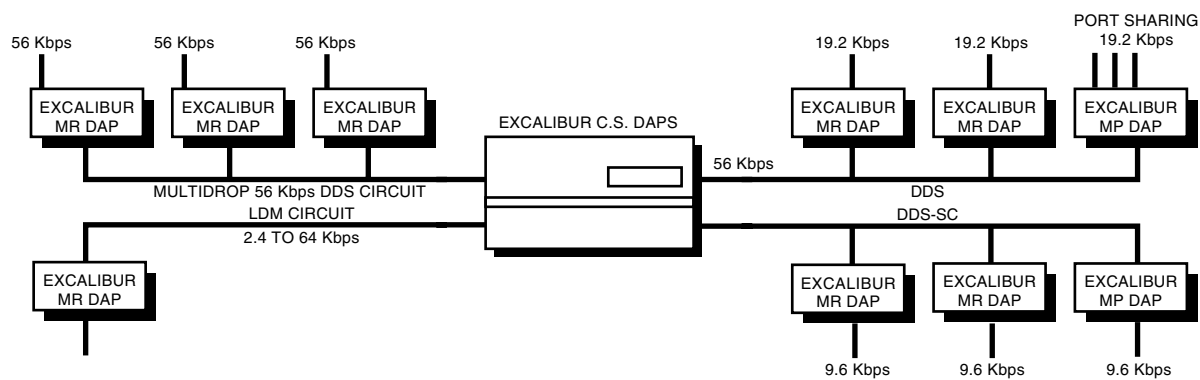


Figure 1-1. Typical Excalibur Multirate DAP Multimode Applications

Models

The Excalibur Multirate DAP comes in standalone and central site models. The part number/serial number label is located on the bottom of the DAP. Table 1-1 lists the part number for each Excalibur Multirate DAP model. The following sections describe the physical characteristics of the standalone and central site models.

Table 1-1. Excalibur Multirate DAP Part Numbers

Part Number	Description
15-09B112001xx	RS-232-E DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B213000xx	RS-232-E DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B313000xx	RS-232-E DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B512001xx	RS-232-E/CCITT V.35 DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B613000xx	CCITT V.35 DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B713000xx	CCITT V.35 DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B112A01xx	RS-232-E with Analog IDBU2 DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B213A00xx	RS-232-E with Analog IDBU2 DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B313A00xx	RS-232-E with Analog IDBU2 DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B512A01xx	RS-232-E/CCITT V.35 with Analog IDBU2 DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B613A00xx	CCITT V.35 with Analog IDBU2 DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B713A00xx	CCITT V.35 with Analog IDBU2 DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B112B01xx	RS-232-E with Switched 56 IDBU DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B213B00xx	RS-232-E with Switched 56 IDBU DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B313B00xx	RS-232-E with Switched 56 IDBU DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B512B01xx	RS-232-E/CCITT V.35 with Switched 56 IDBU DAP, Standalone, Aggregate Card Part No. 15P09AA-6

Table 1-1. Excalibur Multirate DAP Part Numbers (Continued)

Part Number	Description
15-05B613B00xx	CCITT V.35 with Switched 56 IDBU DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B713B00xx	CCITT V.35 with Switched 56 IDBU DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B112C01xx	RS-232-E with ISDN U IDBU DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B213C00xx	RS-232-E with ISDN U IDBU DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B313C00xx	RS-232-E with ISDN U IDBU DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-09B512C01xx	RS-232-E/CCITT V.35 with ISDN U IDBU DAP, Standalone, Aggregate Card Part No. 15P09AA-6
15-05B613C00xx	CCITT V.35 with ISDN U IDBU DAP, Central Site (CS-1), Aggregate Card Part No. 15P0501D-3
15-05B713C00xx	CCITT V.35 with ISDN U IDBU DAP, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-05B313600xx	RS-232-E EDRS DAD, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3
15-05B713600xx	CCITT V.35 EDRS DAD, Central Site (CS-2), Aggregate Card Part No. 15P0501D-3

* xx denotes the software revision level.

Standalone Model

The standalone Excalibur Multirate DAP is housed in a 3"x8"x12" (7.6 cm x 20.3 cm x 30.5 cm) plastic housing. The housing consists of a top and bottom half, fastened together with two screws. The front and rear panels slide vertically into the bottom half of the housing and are held in place by the top half. The DAP can be placed on any flat surface or it can be mounted in a standard 19-inch wide rack (using an optional kit).

The DAP's front panel contains an LCD information screen, two LED indicators, and eight pushbuttons. The rear panel contains the interface connectors used to attach to the DTE, telephone lines, and other network components. The unit is powered by an external power supply operating at 92 to 127 VAC.

Central Site Model

The central site Excalibur Multirate DAP consists of a printed circuit (p.c.) card and a transition board (vertical rear panel) that are designed to be housed in the high-density Excalibur Card Carrier (Figure 1-2). Each card carrier can house up to 16 p.c. cards. Six card carriers, holding up to 96 single port Excalibur Multirate central site DAPs, can be installed in a single 6-foot rack. The card carrier contains a Master Control Panel that can control any of the 96 DAPs in the rack. For more information on the Excalibur Card Carrier, refer to that product's instruction manual.

Note: The Aggregate card requires a single slot if the DAP has no IDBU or if it is equipped with Switched 56 or ISDN IDBU. If the DAP is equipped with Analog IDBU, the Aggregate card requires two card slots since the front portion of the card slot immediately to the left of this card as viewed from the front of the card carrier must be vacant.

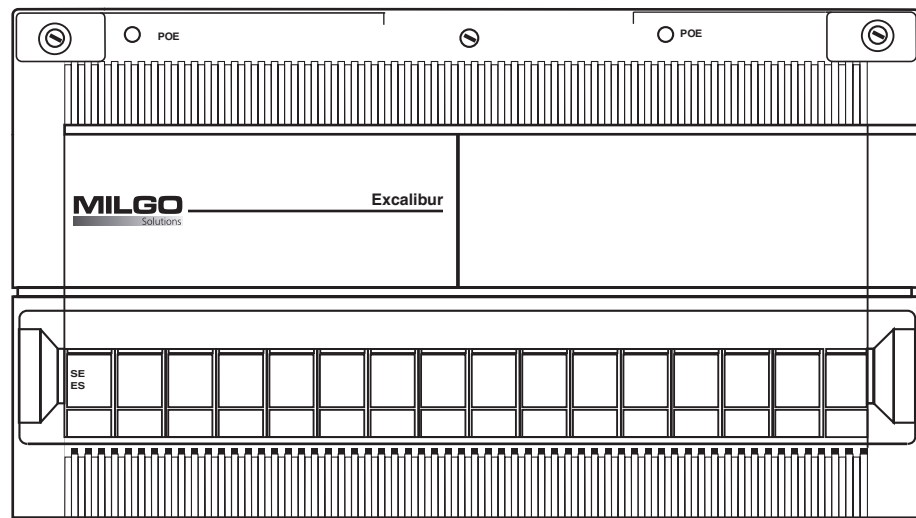


Figure 1-2. Excalibur Card Carrier

Standard Features

The Excalibur Multirate DAP comes with a full complement of standard features, as described in the following sections.

Menu-Driven Front Panel Display

The Excalibur Multirate DAP has a menu-driven front panel display that makes monitoring, configuring, and testing the DAP quick and easy. The two-line LCD screen guides you through the various operating procedures by displaying menu prompts on the top line and selectable options on the bottom line. To select an option, simply press the button beneath it. Figure 1-3 shows a typical menu display in which you are prompted to select the DTE data rate. The LCD screen is backlit for ease of viewing. If two minutes elapse without a front panel button being pressed, the screen dims to reduce power consumption.

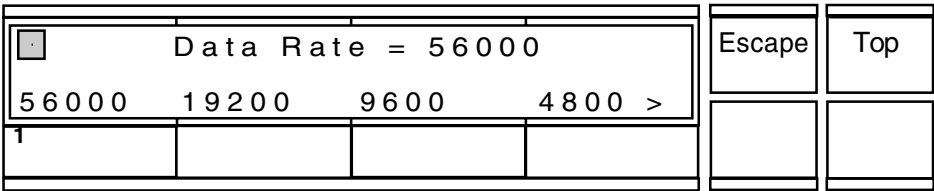


Figure 1-3. Typical Menu Display

Remote Control Panel

The Remote Control Panel (RCP) feature allows you to control remotely located Excalibur DAPs from the front panel of the local DAP. The RCP feature may be activated by both central and remote DAPs. The only exception is when operating in Interruptive Secondary Channel (Basic DDS) mode in a multipoint configuration, the RCP function can only be started from the central unit. By entering the remote unit's address into the local DAP's front panel, you can perform any operating procedure as if you were at that site, with the following exceptions:

- The T7 address cannot be changed.
- The Digital Data Service mode and line speed cannot be changed.
- The End-to-End Error, V.54 Loop 2 and L2 Error, and the Local-Error and Network-Error tests should not be performed.

Password Protection

The Excalibur Multirate DAP provides a password protection feature to prevent users from accessing certain front panel functions. This feature enables you to lock out any or all of the following functions to users who do not enter the proper password: configuration (including secondary channel configuration), remote unit control, dial backup operation, diagnostic testing, the Digital Data Service mode, and the T7 address. The password can be any three-character alphanumeric code.

RTS-DCD Simulation

Two user-selectable methods of RTS-DCD simulation are provided as a means of transmitting control signaling information:

- V.13 - is only supported on synchronous ports.
- Out of Band - can be enabled on synchronous and asynchronous ports. This method does not add bits to the user data stream and allows the use of RTS-DCD Simulation with equipment that is sensitive to in-band signaling.

Extended Range Operation

The DAP receiver accommodates a nominal loop loss of 0 to -34 dB which complies with the requirements of AT&T Publication 62310. The extended range feature automatically allows operation on loops that have an attenuation rate of -40 dB for line rates lower than 56 Kbps, and -45 dB for line rates of 56 and 72 Kbps. The performance in this range is dependent on the telephone company equipment.

Rate Adaption

Rate adaption allows the DTE interface to operate at a lower data rate than the DDS line rate. This feature is available when the DAP is operating with the non-interruptive secondary channel technology on Basic DDS service or Clear Channel 64 Kbps service.

Built-In Diagnostic Tests

The Excalibur Multirate DAP contains an extensive array of diagnostic tests that help you quickly isolate the source of network malfunctions. From the local site, you can initiate Aggregate, Channel (available for Basic DDS with non-interruptive secondary channel mode), and port level tests on both the local and remote site DAPs. The following tests are included:

- Self-Error

- End-to-End Error
- DDS Loop
- Digital Loop, standard and V.54
- V.54 Loop 2 and L2 Error (V.54 Loop 2 not available for DDS with interruptive secondary channel mode)
- Local-Error
- Network-Error

In addition to these operator-initiated tests, the Excalibur Multirate DAP automatically runs an internal self-test each time it is powered up. This test verifies the functionality of the DAP's internal circuitry. Any failures are immediately displayed on the front panel.

Alarm Reporting

To alert you to potential problems in the network, the DAP reports a wide variety of alarm conditions. You can set the DAP to sound a beeper, light a LED indicator, and/or display an alarm message when it detects an alarm condition. Alarm conditions are also reported to the CMS network management system (if the network is so equipped). The DAP stores the reported alarms in memory.

Line Parameter Monitoring

The Excalibur Multirate DAP continuously monitors and computes the values of a number of key DDS line parameters. Monitored parameters include line availability statistics, receive level, and signal quality.

Call Messages

The Excalibur Multirate DAP allows you to exchange messages with a remote DAP operator without making costly telephone calls. With this feature, you can enter up to 10 different numerical codes (0 - 9), each signifying a previously agreed upon message. The DAP then sends the code through the secondary channel to the remote unit. This feature is not available for DDS with interruptive secondary channel mode or Clear Channel 64 Kbps with interruptive secondary channel mode.

Asynchronous/Synchronous Conversion

The Excalibur Multirate DAP can be set to operate with asynchronous or synchronous DTEs. When operating with asynchronous DTEs, the DAP converts the data into a synchronous format using the method specified in CCITT Recommendation V.14. The converter protects against data loss by compensating for small data rate differences between the DTE and the DAP.

CMS DSU Compatibility

The Excalibur Multirate DAP can operate with Milgo's CMS DSU products. Compatibility is provided for primary data transfers between units, T7 transfers between units, and for Loops and Self-Test.

Multiport Frame Compatibility

The Excalibur Multirate DAP can be connected to a multidrop network made up of Excalibur Multiport DAPs, and can interface to any one channel in the aggregate data stream. The unit can operate as a multidrop central or remote. It operates with the same DDS line rates and supports the same DTE data rates as the Excalibur Multiport DAP. This feature is available when the DAP is operating with the non-interruptive secondary channel technology on Basic DDS service.

CMS Compatibility

For those networks that require comprehensive management, testing, and control features, the Excalibur Multirate DAP can operate with Milgo's CMS network management systems. A CMS system provides the following capabilities:

- Line Quality Statistics (LQS) - allows you to measure and graphically display the quality of a transmission line from your central site console. LQS measures the following line availability statistics: percentage of time transmit levels, receive levels, and signal quality are within predefined thresholds; percentage of time the DDS circuit is available for use; percentage of time the DAP is receiving a valid signal from the network; number of Out of Service codes, Abnormal Station codes, network framing errors, and unknown control codes received; number of multiport/multidrop resynchronizations for each drop and total number of multiport/multidrop resynchronizations; number of times the central DAP has resynchronized the entire network (global resync count); number of seconds receive line fault conditions and active network service loops occur.
- Database management - provides you with a complete record of your network's structure, including all sites, components, and channels. A network map display is available as a visual aid when troubleshooting large networks.

- Event files - keep a record of all significant network events (alarms, tests, etc.).
- Network management reports - consolidate network status information so that you can analyze your network's overall performance. Reports can be generated on every major database item.
- Network diagnostics - scan all CMS-compatible components in the network, reporting any irregular conditions. Tests can be run on any network component from the central site console. Can receive alarms from anywhere in the network.
- Serial number reporting - assists in inventory and identification of network DAPs. Each DAP is assigned a serial number, which is reported to the system upon request.

Backward Compatibility

The Excalibur Multirate DAP is able to communicate over the main channel and dial backup lines with older Excalibur Multirate and Excalibur Multiport DAPs.

For customers who have installed current software revisions only, the following conditions apply:

- The following synchronous port data rates are only available for standalone units equipped with Part No. 15-09Bxx2x0xxx and central site units equipped with Part No. 15-05Bxx3x0xxx: 8.4, 10.8, 13.2, 15.6, 18, 20.4, 21.6, 22.8, 24, 25.2, 26.4, 27.6, 28.8, 30, 31.2, 32.4, 33.6, 34.8, 36, 37.2, 39.6, 40.8, 42, 43.2, 44.4, 45.6, 46.8, 48, 49.2, 50.4, and 51.6 Kbps. The 56 Kbps rate when the DAP is operating with the non-interruptive secondary channel technology on Clear Channel 64 Kbps service.
- The following asynchronous port data rates are only available for standalone units equipped with Part No. 15-09Bxx2x0xxx and central site units equipped with Part No. 15-05Bxx3x0xxx: 24, 28.8, 48, and 57.6 Kbps.

Standalone Excalibur Multirate DAPs (Models 15-09B) are equipped with Aggregate card Part No. 15P09AA. Older standalone DAPs (Models 15-05A and 15-05B) are equipped with a Model A (Part No. 15P0501A) or Model C (Part No. 15P0501C) Aggregate card. Central site Excalibur Multirate DAPs are equipped with a Model D Aggregate card (Part No. 15P0501D). Older central site DAPs are equipped with a Model A (Part No. 15P0501A) or Model C (Part No. 15P0501C) Aggregate card. If you install the current software revision on a unit equipped with a Model A or C Aggregate card, the following conditions apply in addition to those previously listed:

- LADC operation is provided.
- The transmitter must be calibrated whenever the power supply is changed as described in Chapter 3, "Calibration."

- The extended range feature can be enabled from the front panel for all DTE rates when the service is set for LADC or LDM. For all other services, it can be enabled when the DTE rate is 19.2 Kbps or greater. Extended range operation is automatic for units equipped with the Model D or 15P09AA-1 Aggregate card.

Options

The Excalibur Multirate DAP provides several options to meet your specific network requirements. The options are described in the following sections.

Dual Interface

The dual interface option provides a V.35 interface connection in addition to the standard RS-232-E connection. Simply select the V.35 option from the front panel, change a jumper setting on the printed circuit card, and connect to the V.35 adapter instead of the RS-232-E connector.

Integral Dial Backup

You can select from the following Integral Dial Backup (IDBU) options:

- 2-wire Analog IDBU
- 4-wire Switched 56 Kbps IDBU
- 2-wire Integrated Services Digital Network (ISDN) IDBU

An IDBU option allows you to decrease your network's down time with dial backup in the event the network or digital lines go down. (See Figure 1-4.) The dial backup telephone line connection can be established automatically, manually, or in response to CMS network management system commands. When set for automatic operation, the DAP automatically initiates dial backup calls in response to user-selectable criteria (such as loss of signal on the digital line). With manual operation, dial backup calls can be initiated by pressing the proper buttons on the DAP's front panel. In networks equipped with a CMS network management system, dial backup calls can be initiated from the CMS console.

Analog IDBU can operate in either Programmable or Permissive Mode. In Programmable Mode, a limiting resistor in the telephone company's data jack programs the DAP so that the signal level received at the central office does not exceed -12 dBm. In Permissive Mode, the DAP's transmit level is fixed internally at -9 dBm. Both modes support tone and pulse dialing.

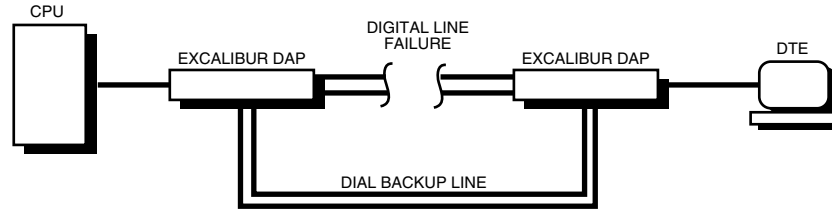


Figure 1-4. Dial Backup Connection

Switched 56 IDBU operates at 56 Kbps over MCI's Switched 56 Service, AT&T's Accunet Switched 56 Service, or Sprint's Enhanced Switched 56 Service, which does not require suppression of echo cancelers. It complies with all requirements of AT&T's Accunet Switched 56 Service, with AT&T Publications 62310 and 41458, and with Sprint's Specification TS-0046. The IDBU accommodates a nominal loop loss of 0 to -31 dB which complies with the requirements of AT&T Publication 62310. It automatically operates in extended range to accommodate loop loss from -32 to -45 dB. The performance in this range is dependent on the telephone company equipment.

The ISDN IDBU operates over the ISDN Basic Rate service. This service provides two full-duplex 64-Kbps channels (B-channels) for transporting data and one full-duplex 16-Kbps access channel (D-channel) for carrying control or signaling information. The ISDN IDBU operates on one 64-Kbps B-channel and the 16-Kbps D-channel. The IDBU complies with the following documents:

- All requirements of ANSI North American Standard T1.601 - 1992, "Integrated Services Digital Network (ISDN) - Basic Access Interface for Use on Metallic Loops for Application on the Network Side of the NT (Layer 1 Specification)."
- All network requirements of Bellcore Special Report SR-NWT-001937, Issue 1, Feb. 1991, "National ISDN-1."
- Bellcore Technical Reference TR-TSY-000793, Issue 1, Oct. 1988, "ISDN D-Channel Exchange Access Signaling and Switching Requirements (Layer 2)."
- Bellcore Technical Reference TR-TSY-000268, Issue 3, May 1989 and Supplement 1, June 1990, "ISDN Access Call Control Switching and Signaling Requirements (Layer 3)."
- Northern Telecom Document No. NIS-S208-4, October 1988, "ISDN Basic Rate Access User Network Interface Specification."
- AT&T Document 5D5-900-311, Issue 1.01, March 1989, "5ESS Switch ISDN Basic Rate Interface Specification, 5E5 Generic Program."

The ISDN IDBU supports AT&T 5ESS, NTI DMS-100, and National ISDN-1 switch types. Appendix B provides a checklist to use when ordering Basic ISDN Service from your local telephone company.

Model for EDRS

The Excalibur Multirate DAP is also available in a model designed to operate with the Excalibur Dial Restoral System (EDRS). This model is called an Excalibur Multirate Dedicated Access Device (DAD). The EDRS provides dial backup by routing data transmission to dial backup lines whenever a dedicated digital circuit fails. The EDRS provides dial backup for Excalibur Multirate and Excalibur Multiport DADs in both point-to-point and multidrop applications.

The EDRS allows concurrent dial backup of up to four dedicated circuits (point-to-point and/or multidrop) per card carrier. For example, four 3-drop multidrop circuits can be in dial backup at the same time. In a 6-card carrier system (one full rack), the EDRS allows concurrent dial backup of up to 24 circuits.

Chapter 2

Operating Modes

Overview

This chapter provides information about each operating mode and how it functions. It includes a detailed description of secondary channel operation, integral dial operation, and asynchronous/synchronous conversion.

Interruptive Secondary Channel (Basic DDS)

The Interruptive Secondary Channel (Basic DDS) operating mode provides an interruptive secondary channel. This feature allows you to perform diagnostics and Remote Control Panel (RCP) functions on a unit that does not have a dedicated secondary channel. Data transfer between the DTE and the DDS network is interrupted when the secondary channel is in use. When operating in this mode, the Excalibur Multirate DAP can operate with Milgo's CMS DSU RD and CMS 6424 products.

The level of compatibility provided with the current CMS DSU 500 RD, CMS DSU 556 RD, and CMS 6424 products is as follows:

- Primary data transfers between units.
- T7 data transfers between units (once a remote has been selected).
- Loops and Self tests.
- End-to-End test is compatible with the CMS DSU 500 RD when the test pattern is 511, and is compatible with the CMS 6424. It is not compatible with the CMS DSU 556 RD.
- RCP feature is not compatible.

The level of compatibility provided with the current DSU 500 RD, DSU 556 RD, and DSU 6424 products is as follows:

- Primary data transfers between units only.
- T7 data transfer between units is not compatible.

The interruptive secondary channel function can be initiated from the front panel of your local unit or from a CMS network management system. The only exception is that in a multipoint configuration, the RCP feature can only be started from the central unit.

Note: Either the RCP feature or the CMS network management system can use the secondary channel. Both should not be active simultaneously.

The DAP with interruptive diagnostics has two basic modes of operation:

- Normal - In the Normal mode, data transfer between the DTE and DDS (main channel data) is allowed to pass unrestricted through the DAP. When the DAP is configured to operate in Normal mode (local and remote diagnostics parameters disabled), it is compatible with other DSUs that comply with the requirements defined in AT&T Publication 62310.
- Diagnostic - In the Diagnostic mode, main channel traffic is blocked by the DAP. Diagnostic testing of the units and the DDS service can be performed. Access to tail circuits is not supported in this mode.

Primary Channel Interface

Interruptive diagnostic operation affects the following DTE signals:

- Request-to-Send (RTS) - When this circuit is Off, the unit normally transmits idle sequences to the network. If interruptive diagnostics are active, the unit may be transmitting diagnostic data to the network even when RTS is Off.
- Clear-to-Send (CTS) - When interruptive diagnostics are active, CTS is Off.
- Data Carrier Detect (DCD) - An Off condition normally indicates that idle sequences or a fault condition has been detected by the DAP. When interruptive diagnostics are active, an Off condition indicates that the network is in Diagnostic mode. Receive data is Marking during interruptive diagnostics.

Network Management Controller

The Network Management Controller (NMC) can be either a CMS network management system or the front panel depending on whether the Excalibur Multirate DAP is configured for external control (CMS) or RCP control. When configured for RCP control, the front panel assumes the role of controller and performs many of the network management functions. It monitors, executes, and replies to T7 commands received at the Network Management Interface (NMI) port.

The NMC can communicate with a central unit without interrupting main channel data. Communication between the NMC and any remote unit requires switching the DAP into the Diagnostic mode, which interrupts main channel operation.

Main Channel Interruption

Main channel interruption is the one significant effect interruptive diagnostics has on network operation. Because the unit blocks main channel traffic, you will have to take the necessary precautions to ensure the minimal impact on your network operations when interruptive diagnostics are being used.

Non-Interruptive Secondary Channel (DDS-SC)

The Non-Interruptive Secondary Channel (DDS-SC) mode provides an out-of-band secondary channel supplied by the DDS-SC service. The DDS network allows additional bandwidth for the secondary channel and does not interrupt primary channel data. When operating in this mode, the Excalibur Multirate DAP can operate with Milgo's CMS DSU 1500 and CMS DSU 1556 products. The secondary channel can also be used for a customer application.

The level of compatibility provided with the current CMS DSU 1500 and CMS DSU 1556 products is as follows:

- Primary data transfers between units.
- T7 data transfers between units (once a remote has been selected).
- Loops and Self tests.
- End-to-End test is compatible with the CMS DSU 1556 when the test pattern is 2047. It is not compatible with the CMS DSU 1500.
- RCP feature is not compatible.

If you can not guarantee the required one's density (Bell Core TR-NLP 00157) in 56 Kbps multidrop operation, the network must be provisioned with Clear Channel 64 Kbps capability.

The Non-Interruptive Secondary Channel function can be initiated from the front panel of your local unit or from a CMS network management system.

Note: Either the RCP feature or the CMS network management system can use the secondary channel. Both should not be active simultaneously.

Non-Interruptive Secondary Channel (Basic DDS and Clear Channel 64 Kbps)

The Basic DDS Non-Interruptive Secondary Channel (DDSNI) and the Clear Channel 64 Kbps Non-Interruptive Secondary Channel (C64NI) modes provide a non-interruptive secondary channel over basic DDS or Clear Channel 64 lines in exchange for a small amount of bandwidth. The DDSNI mode can operate in both point-to-point and multipoint network configurations. The C64NI mode operates only in point-to-point network configurations. The maximum main channel (DTE) data rates are listed in Table 2-1.

Table 2-1. DDSNI and C64NI DTE Rates

DDS Line	Maximum DTE Rate
2.4 Kbps	2.1 Kbps
4.8 Kbps	4.5 Kbps
9.6 Kbps	9.0 Kbps
19.2 Kbps	18.0 Kbps
56.0 Kbps	52.8 Kbps
64.0 Kbps	57.6 Kbps

The remaining bandwidth is used for framing, out of band RTS-DCD simulation, and the non-interruptive secondary channel. The non-interruptive secondary channel can be used for a customer application. The Network Management Controller (NMC) can be either a CMS network management system or the front panel depending on whether the Excalibur Multirate DAP is configured for external control (CMS) or RCP control. When configured for RCP control, the front panel assumes the role of controller and performs many of the network management functions.

The non-interruptive secondary channel function can be initiated from the front panel of your local unit or from a CMS network management system.

Note: Either the RCP feature or the CMS network management system can use the secondary channel. Both should not be active simultaneously.

Rate Adaption is available for the DDSNI and C64NI modes. This feature allows you to set the DTE interface to operate at a lower data rate than the DDS line rate. The available DTE data rates are listed in the “Port Rate Configuration” section in Chapter 5.

Clear Channel 64 Kbps

The Clear Channel 64 Kbps (CC64) mode operates on the Clear Channel 64 Kbps service offered by ASDS. This service provides 64 Kbps to use for data. An interruptive secondary channel is provided. When the secondary channel is in use, 57.6 Kbps is available for data.

Note: The CMS network management system can communicate with the central unit.

Customer Owned Copper Wire (LDM)

When operating over customer owned copper wire, two back-to-back Excalibur Multirate DAPs provide short-haul point-to-point limited distance communications capabilities. The secondary channel operation is identical to that for the Non-Interruptive Secondary Channel (DDS-SC) mode. The secondary channel is not available when the line rate is set to 64 Kbps.

Clear Secondary Channel

The Excalibur Multirate DAP provides the Clear Secondary Channel feature when the unit is operating in DDSNI, DDS-SC, LADC, LDM, or C64NI mode. When this feature is enabled, you can use the secondary channel bandwidth for your own application. All T7 diagnostic and RCP functions are disabled.

Note: LADC is only available for units equipped with the Model A or C Aggregate card.

You can use this channel only with asynchronous data protocols. The character format is one start bit, eight data bits, and two stop bits. The available DTE rates depend on the service and the DDS line rate as listed in Table 2-2.

Table 2-2. Clear Secondary Channel Rates

DDS Line	DDS-SC, LDM, LADC ¹	DDSNi, C64Ni
2.4 Kbps	75 bps	75 bps
4.8 Kbps	75, 150 bps	75 bps
9.6 Kbps	75, 150, 300 bps	75, 150 bps
19.2 Kbps	75, 150, 300, 600 ² bps	75, 150, 300 bps
56 Kbps	75, 150, 300, 600 ² , 1200 ² bps	75, 150, 300 bps
64 Kbps	Not Applicable	75, 150, 300 bps

1. LADC is only available for units equipped with the Model A or C Aggregate card.
2. The 600 and 1200 bps rates are not available for units equipped with the Switched 56 IDBU or the ISDN IDBU feature.

Antistreaming

The RTS Antistreaming feature prevents a DTE from holding the communication channel indefinitely. When a DTE keeps its RTS signal raised for longer than a user-selectable time period, the DAP disconnects it. The streaming DTE must lower its RTS signal before the DAP will scan it again.

DCD Antistreaming is effective only when V.13 DCD Simulation is enabled. This function acts as a backup to prevent an application from becoming stalled as a result of a missed V.13 DCD drop code or other similar condition caused by a line hit or a power failure.

Analog Integral Dial Operation

The Excalibur DAP's Analog IDBU feature enables both the primary and secondary channels to transmit data across the dial-up telephone line when the dedicated line fails. It can also enable the secondary channel to transmit data across the dial-up line, while the primary channel transmits data over the digital lines. To establish the dial-up connection, the originating DAP must place a telephone call to the answering DAP. The call can be initiated in three ways: 1) automatically by the DAP, 2) manually through the DAP's front panel, or 3) manually through the CMS system console.

Two user-selectable modes of operation are available:

- **V.32bis** - compliant with CCITT recommendations. This mode does not support a secondary channel. Therefore, if the unit is a remote and a CMS link exists during normal operation (all operating modes except CC64), the link is lost when the unit is in dial backup operation.
- **V.32bis+** - an enhanced Milgo mode which supports a secondary channel. Secondary channel data is transmitted using a constellation multiplexed scheme. This channel is compatible with the Milgo T7 channel. Therefore remote units that did not have a continuously available CMS link (DDS operating mode) during normal operation will have this link when the unit is in dial backup operation. For remote units, the DAP provides an NMI connector for Second Level T7 devices. This mode is not compliant with CCITT recommendations and should only be used when connecting to another Excalibur DAP with Analog IDBU.

The following features are not available when the DAP is in dial backup operation:

- Clear Secondary Channel
- Rate Adaption

When configured for automatic dialing, the DAP places the required telephone call in response to one of the following user-selectable conditions:

- **DDS Down** - DDS goes down due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing for a user-selectable time period.
- **No Signal** - an invalid DDS signal is received from the network.
- **Network Down** - the DAP dials after the DDS network goes down or an invalid signal is received from the network.
- **DTR** - the DAP dials when the DTR signal is active. This setting allows external routers and FRADs to originate dial backup calls.

Note: The DAP will not automatically dial when it is in a test state such as End-to-End Network Loops.

You may select any DAP in the network (remote or central) for automatic dialing. Both DAPs can answer a call, but only one should be configured to automatically originate the call.

When a dial backup connection is initiated (through any of the methods), the following events occur:

1. The originating DAP goes off-hook and dials the previously stored primary telephone number of the answering DAP.

2. When the answering DAP detects a ringing signal on the dial line, it answers the call.
3. A handshake takes place between the originating and answering units to verify the connection.
4. If the handshake is successful, the DAPs are connected to the dial line.

Front Panel Status Information

The following status information is displayed on the front panel while the dial-up connection is being established (through any of the methods):

- A line is taken off-hook.
- Call progress information such as no dial tone on the line, busy signal, etc.
- Whether the dial line is connected or disconnected.

Call Establishment

When the dial backup connection is initiated and automatic dial is enabled on the originating DAP, the answering DAP's primary telephone number is dialed. When automatic dial is disabled, you may manually dial the answering DAP's primary or any of its four alternate telephone numbers.

Call Answering

When automatic call answering is enabled, the DAP answers incoming dial line calls in response to one of the following user-selectable conditions:

- **Always** - the DAP always answers calls.
- **DDS Line or Local Loop Down** - the DAP only answers calls when the DDS line goes down (due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing) or when an invalid DDS signal is received from the network.
- **No Signal** - the DAP only answers calls when an invalid DDS signal is received from the network.

The DAP constantly monitors the dial line for a ringing signal. When ringing is detected, the DAP automatically answers the call in response to the selected condition. When the dial backup connection is successfully established, the DAP displays the message `Switched To Dial` on the front panel followed by an audible beep. When automatic answering is disabled or when the selected condition is not present, the DAP informs the front panel that ringing is detected, but it will not answer the call.

Call Disconnection

Dial line calls can be disconnected automatically or manually. When automatic call disconnection is enabled, the DAP disconnects the dial line and switches data transmission back to the dedicated line when the Data Terminal Ready (DTR) signal from the dial backup port goes Off.

Manual call disconnection requires that you enter commands through the DAP's front panel or the CMS system console. The DAP then switches transmission back to the dedicated line.

Switched 56 Integral Dial Operation

The Excalibur DAP's Switched 56 IDBU feature enables both the primary and secondary channels to transmit data across the dial-up telephone line when the dedicated line fails. To establish the dial-up connection, the originating DAP must place a telephone call to the answering DAP. The call can be initiated in three ways: 1) automatically by the DAP, 2) manually through the DAP's front panel, or 3) manually through the CMS system console.

The DTE data rate can not be selected when the DAP is in dial backup operation. The rate selected for normal operation is maintained during dial backup operation with two exceptions:

- 64 Kbps is automatically changed to 56 Kbps (CC64, LADC, and LDM operating modes).
- 57.6 Kbps is automatically changed to 52.8 Kbps (C64NI operating mode with multiport framing disabled). Dial backup operation is not provided for C64NI operating mode when the data rate is 57.6 Kbps with multiport framing enabled.

When the DAP is in dial backup operation and the DTE data rate is 56 Kbps, no secondary channel is provided. Therefore, if the unit is a remote, the CMS link that exists during normal operation is lost when the unit is in dial backup operation. When the DAP is in dial backup operation and the DTE data rate is 52.8 Kbps or below, a non-interruptive secondary channel is provided. This channel is compatible with the Milgo T7 channel. For remote units, the DAP provides an NMI connector for Second Level T7 devices except when the operating mode is DDS.

The Clear Secondary Channel feature is provided during dial backup operation. The only restriction is that the 600 and 1200 bps channel rates are not available when the Switched 56 IDBU option is installed.

When configured for automatic dialing, the DAP places the required telephone call in response to one of the following user-selectable conditions:

- **DDS Down** - DDS goes down due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing for a user-selectable time period.
- **No Signal** - an invalid DDS signal is received from the network.
- **Network Down** - the DAP dials after the DDS network goes down or an invalid signal is received from the network.
- **DTR** - the DAP dials when the DTR signal is active. This setting allows external routers and FRADs to originate dial backup calls.

Note: The DAP will not automatically dial when it is in a test state such as End-to-End Network Loops.

You may select any DAP in the network (remote or central) for automatic dialing. Both DAPs can answer a call, but only one should be configured to automatically originate the call.

When a dial backup connection is initiated (through any of the methods), the following events occur:

1. The originating DAP goes off-hook. When it detects a wink (dial tone) from the network, it dials the previously stored primary telephone number of the answering DAP.
2. The answering DAP detects the incoming call as a line seizure (off-hook state) from the network. After determining that the line seizure was not a line hit, the answering DAP goes off-hook to signal the network that it has answered the call.
3. The network presents a line seizure to the originating DAP to signal that the answering DAP has answered the call.
4. The data path is now complete and both DAPs switch over to the dial line.

Front Panel Status Information

The following status information is displayed on the front panel while the dial-up connection is being established (through any of the methods):

- A dial backup connection is being established.

- When calls have been successfully connected.
- Whether the dial line is connected or disconnected.
- Call progress information (ringing, busy signal) when the DAP is connected to Sprint's Enhanced Switched 56 Service.

Call Establishment

When the dial backup connection is initiated and automatic dial is enabled on the originating DAP, the answering DAP's primary telephone number is dialed. When automatic dial is disabled, you may manually dial the DAP's primary or any of its four alternate telephone numbers.

Call Answering

When automatic call answering is enabled, the DAP answers incoming dial line calls in response to one of the following user-selectable conditions:

- **Always** - the DAP always answers calls.
- **DDS Line or Local Loop Down** - the DAP only answers calls when the DDS line goes down (due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing) or when an invalid DDS signal is received from the network.
- **No Signal** - the DAP only answers calls when an invalid DDS signal is received from the network.

The DAP constantly monitors the dial line for a ringing signal. When ringing is detected, the DAP automatically answers the call in response to the selected condition. When the dial backup connection is successfully established, the DAP displays the message *Switched To Dial* on the front panel followed by an audible beep. When automatic answering is disabled or when the selected condition is not present, the DAP informs the front panel that ringing is detected, but it will not answer the call.

Call Disconnection

Dial line calls can be disconnected automatically or manually. When automatic call disconnection is enabled, the DAP disconnects the dial line and switches data transmission back to the dedicated line when the Data Terminal Ready (DTR) signal from the port's DTE goes Off.

Manual call disconnection requires that you enter commands through the DAP's front panel or the CMS system console. The DAP then switches transmission back to the dedicated line.

ISDN Integral Dial Operation

The Excalibur DAP's ISDN IDBU feature enables both the primary and secondary channels to transmit data across the dial-up telephone line when the dedicated line fails. The DTE data rate can not be selected when the DAP is in dial backup operation. The rate selected for normal operation is maintained during dial backup operation. Synchronous DTEs support up to 64 Kbps without a secondary channel and up to 57.6 Kbps with a secondary channel.

When the DAP is in dial backup operation with another DAP equipped with ISDN IDBU, a non-interruptive secondary channel is provided when the DTE rate is 57.6 Kbps or below (all DDS services except CC64). This channel is compatible with the Milgo T7 channel. For remote units, the DAP provides an NMI connector for Second Level T7 devices except when the operating mode is DDS or CC64.

When the DAP is in dial backup operation with another DAP equipped with Switched 56 IDBU, a non-interruptive secondary channel is provided when the DTE rate is 52.8 Kbps or below. This channel is compatible with the Milgo T7 channel. For remote units, the DAP provides an NMI connector for Second Level T7 devices except when the operating mode is DDS. When the DTE data rate is 56 Kbps or above, no secondary channel is provided. Therefore, if the unit is a remote and a CMS link exists during normal operation (all operating modes except CC64), the link is lost when the unit is in dial backup operation.

The Clear Secondary Channel feature is provided during dial backup operation with the following restrictions:

- The 600 and 1200 bps channel rates are not available.
- When the far-end unit is equipped with Switched 56 IDBU, this feature is not available if the DTE rate is 56 Kbps or above.
- This feature is not available when the unit is configured to support T7 diagnostic traffic over the secondary channel.

Call Initiation

To establish the dial-up connection, the originating DAP must place a telephone call to the answering DAP. The call can be initiated in three ways: 1) automatically by the DAP, 2) manually through the DAP's front panel, or 3) manually through the CMS system console. When configured for automatic dialing, the DAP places the required telephone call in response to one of the following user-selectable conditions:

- **DDS Down** - DDS goes down due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing for a user-selectable time period.
- **No Signal** - an invalid DDS signal is received from the network.
- **Network Down** - the DAP dials after the DDS network goes down or an invalid signal is received from the network.
- **DTR** - the DAP dials when the DTR signal is active. This setting allows external routers and FRADs to originate dial backup calls.

Note: The DAP will not automatically dial when it is in a test state such as Channel Network Loops.

You may select any DAP in the network (remote or central) for automatic dialing. Both DAPs can answer a call, but only one should be configured to automatically originate the call.

Front Panel Status Information

When the ISDN IDBU and the network have synchronized and completed the activation process and the D-channel is ready to exchange control messages, the following status information is displayed on the front panel while the dial-up connection is being established (through any of the methods):

- A dial backup connection is being established.
- When calls have been successfully connected.
- Whether the dial line is connected or disconnected.
- Call progress information (ringing, busy).

Call Establishment

When the dial backup connection is initiated and automatic dial is enabled on the originating DAP, the answering DAP's primary telephone number is dialed. When automatic dial is disabled, you may manually dial the DAP's primary or any of its four alternate telephone numbers.

Call Answering

When automatic call answering is enabled, the DAP answers incoming dial line calls in response to one of the following user-selectable conditions:

- **Always** - the DAP always answers calls.
- **DDS Line or Local Loop Down** - the DAP only answers calls when the DDS line goes down (due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing) or when an invalid DDS signal is received from the network.
- **No Signal** - the DAP only answers calls when an invalid DDS signal is received from the network.

The DAP constantly monitors the dial line for a ringing signal. When ringing is detected, the DAP automatically answers the call in response to the selected condition. When the dial backup connection is successfully established, the DAP displays the message `Switched To Dial` on the front panel followed by an optional audible beep. When automatic answering is disabled or when the selected condition is not present, the DAP informs the front panel that ringing is detected, but it will not answer the call.

Call Disconnection

Dial line calls can be disconnected automatically or manually. When automatic call disconnection is enabled, the DAP disconnects the dial line and switches data transmission back to the dedicated line when the Data Terminal Ready (DTR) signal from the port's DTE goes Off.

Manual call disconnection requires that you enter commands through the DAP's front panel or the CMS system console. The DAP then switches transmission back to the dedicated line.

Asynchronous/ Synchronous Conversion

The Excalibur Multirate DAP can be set to receive data from asynchronous DTEs. The DAP performs asynchronous to synchronous conversion using the method specified by CCITT Recommendation V.14.

Note: Tandem operation between two Excalibur DAPs using the V.14 conversion method can only be established with cascaded synchronous devices. Therefore, V.14 conversion should only be enabled at both ends of a circuit and not at any intermediate points.

When set for asynchronous operation, the DAP port places each character of data received from the transmitting DTE into a one-character buffer. It then sends the characters to the central DAP, using the port's transmit clock for timing. At the receiving end of the network, the central DAP passes each received character to the port's buffer, using its receive clock for timing. The port then passes the data through to the DTE.

If the transmitting DTE sends characters to the port at a slightly faster rate than the DAP removes them, the DAP deletes stop bits from the incoming characters. If the transmitting DTE sends characters to the port at a slower rate than they are removed, the DAP inserts extra stop bits between characters. At the receiving end, if the DAP receives characters at a faster rate than they are passed to the DTE, the DAP reduces the length of a stop bit.

The maximum DTE/DAP rate differential for which the Excalibur Multirate DAP can compensate depends on the asynchronous mode you select. In Normal mode, the DAP can compensate for a rate differential of +1%, -2.5%. In Extended mode, the maximum rate differential allowed is +2.3%, -2.5%. The use of Normal mode is preferred because it results in lower distortion. The converter accepts either 8, 9, 10, or 11 bit characters with one unit start bit and one unit stop bit. Data units can be replaced by additional stop bits.

Port speeds from 75 bps to 19.2 Kbps are supported. The minimum DAP channel rate is 2400 bps for DDS, DDS-SC, LADC, and LDM services. For DDSNI and C64NI services, the minimum DAP channel rate is 1200 bps. If asynchronous rates below these speeds are required, the DAP channel rate remains at 2400 bps or 1200 bps and the asynchronous/ synchronous converter handles the rate adaption.

Note: LADC is only available for units equipped with the Model A or C Aggregate card.

Chapter 3

Installing the DAP

Overview

The following steps must be completed to install the Excalibur Multirate DAP:

1. Place the unit in a suitable location.
2. Connect the unit to the DTE, telephone lines, and accessory equipment.
3. Set the jumpers on the printed circuit (p.c.) card.
4. Connect the power supply to the DAP and the AC power outlet.

This chapter explains how to perform each of these procedures. It also contains pin/signal assignments for each of the DAP's connectors and descriptions of the cables used with each connector.

Note: This chapter explains how to install the standalone version of the Excalibur Multirate DAP. For instructions on installing the central site version, refer to the *Excalibur Card Carrier Installation and Operation Manual*.

Unit Placement

The first step in installing the Excalibur Multirate DAP is to place it in a suitable location. The DAP can be placed on any stable, flat surface or it can be mounted in a standard 19-inch (48 cm) equipment rack using the optional Rack Mount Kit (Part No. 900-1213A-2). An optional Wall Mount Kit (Part No. 900-1219A-2) is also available with the unit. Installation instructions are provided with both of these kits.

Whether placed on a flat surface or in a rack, the installed DAP must meet the following requirements:

- The physical location must permit cable connections at the rear panel.
- The front panel must be accessible and visible.
- The air intake and exhaust must not be obstructed.
- The DAP must be physically stable and protected from corrosive spray or atmosphere.

Cable Connections

After the DAP has been placed in a suitable location, the necessary cable connections can be made. All interface connectors are located on the DAP's rear panel as shown in Figure 3-1.

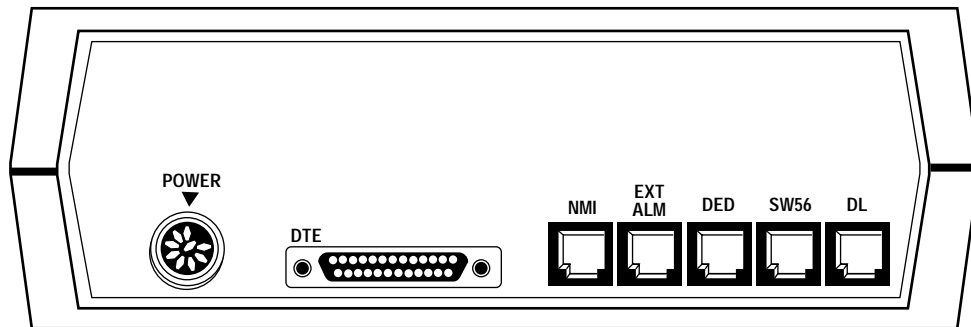


Figure 3-1. Excalibur Multirate DAP Rear Panel

Connecting to the DTE

The Excalibur Multirate DAP provides a 25-pin RS-232-E female connector, labeled **DTE**, for connecting to the DTE. The dual interface DAP is equipped with a strap-selectable RS-232-E or V.35 interface. The correct cable or adapter to use depends on the interface selected:

- **RS-232-E** - Use a standard EIA RS-232 cable (25-pin male to 25-pin female) to make this connection. This cable is typically supplied with the DTE. To connect to the DTE, plug the male end of the cable into the DAP and plug the female end into the DTE. Figure 3-2 illustrates this connection. Table 3-1 lists the pin/signal assignments for this connector.
- **V.35** - Use Adapter Part No. 27C522-02 (25-pin male to 34-pin female) to make this connection. This adapter is provided with the dual interface DAP. Use a standard V.35 cable (34-pin male to 34-pin female) to make this connection. This cable is typically supplied with the DTE. To connect to the DTE, plug the male end of the cable into the adapter and plug the female end into the DTE. Figure 3-3 illustrates this connection. Table 3-2 lists the pin/signal assignments for this connector. (Older dual interface DAPs, Models 15-05A and 15-05B, are equipped with a 34-pin female connector, labeled **DTE V.35**, for connecting to the DTE. Use a standard V.35 cable to make this connection. To connect to the DTE, plug the male end of the cable into the DAP and plug the female end into the DTE. The pin/signal assignments for this connector are identical to those listed in Table 3-2.)

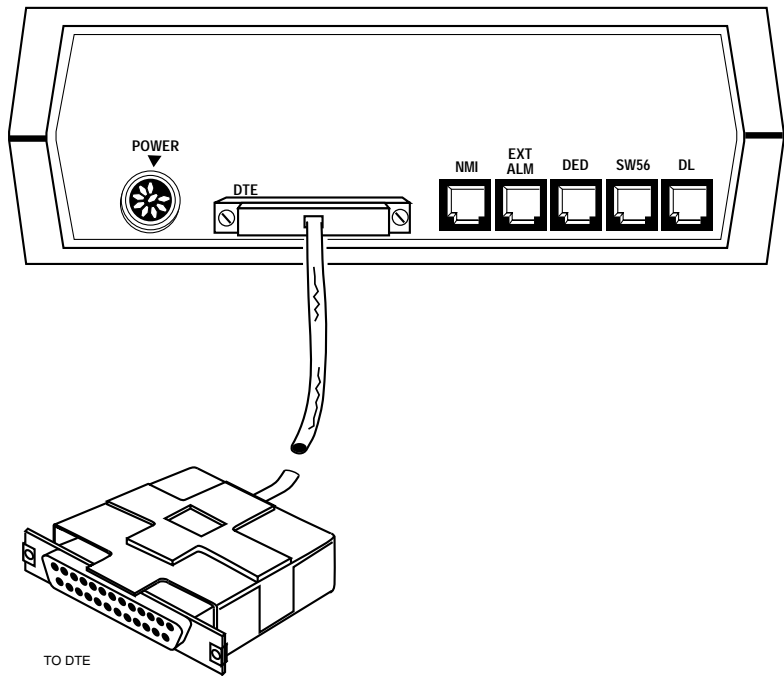


Figure 3-2. RS-232 DTE Connection

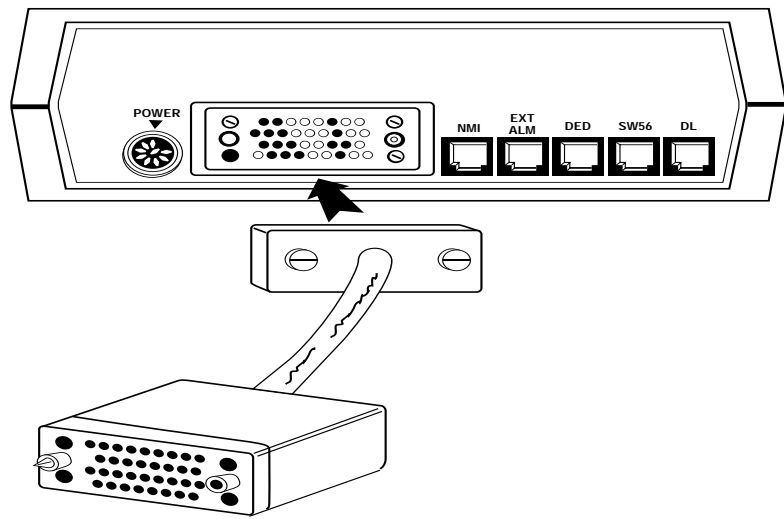


Figure 3-3. V.35 DTE Connection

Table 3-1. RS-232 DTE Connector, Pin/Signal Assignments

Pin No.	CCITT V.24 Symbol	RS-232 Symbol	Input/ Output	Function
1	101	–	–	Not used.
2	103	BA	Input	Transmit Data. Serial binary signals from DTE.
3	104	BB	Output	Receive Data. Serial binary signals to DTE.
4	105	CA	Input	Request-to-Send (RTS). Indicates DTE is ready to send data.
5	106	CB	Output	Clear-to-Send (CTS). Indicates DAP is ready to transmit data.
6	107	CC	Output	Data Set Ready (DSR). Indicates DAP operating normally, ready to transmit and receive data.
7	102	AB	–	Signal ground. Common ground reference for all circuits.
8	109	CF	Output	Data Carrier Detect (DCD). Indicates DAP is receiving a carrier signal from the remote DAP.
9	–	–	Output	Positive Test Voltage (+12 V).
10	–	–	Output	Negative Test Voltage (-12 V).
11	–	–	–	Not used.
12A*	122	SCF	Output	Secondary Channel DCD. Indicates that secondary channel signals are being received. Used with central site units.
12B*	–	–	Input	Digital Power Failure input. Used with remote site units.
13	121	SCB	Output	Secondary Channel CTS.

* The signal assigned to this pin is selected through the DAP's configuration menu and/or its jumper settings.

Table 3-1. RS-232 DTE Connector, Pin/Signal Assignments (Continued)

Pin No.	CCITT V.24 Symbol	RS-232 Symbol	Input/Output	Function
14	118	SBA	Input	Secondary Channel Transmit Data.
15	114	DB	Output	Transmit Clock.
16	119	SBB	Output	Secondary Channel Receive Data.
17	115	DD	Output	Receive Clock.
18	141	LL	Input	Local Digital Loopback. An On condition places the DAP into a Digital Loop test.
19A*	120	SCA	Input	Secondary Channel RTS. Used with remote site units.
19B*	–	–	Output	Digital Power Failure output. Used with central site units.
20	108/1, 108/2	CD	Input	Data Terminal Ready (DTR). An On condition indicates DTE is requesting the port. When the signal is Off, the port is not in use.
21A*	110	CG	Output	Signal Quality. An On condition indicates that a signal quality of Good or Best is displayed on the front panel. An Off condition indicates that a signal quality of Fair or Poor is displayed.
21B*	140	RL	Input	Remote Digital Loop Command. An On condition sends the far-end DAP into a V.54 Loop test.
22	125	CE	–	Not supported.
23A	111, 112	CH	Output	Signal Indicator. Active when the DDS line is available. Inactive when the DDS line is lost.
24	113	DA	Input	External Transmit Clock.
25	142	TM	Output	Test Mode. On when the DAP is in a test.

* The signal assigned to this pin is selected through the DAP's configuration menu and/or its jumper settings.

Table 3-2. V.35 DTE Connector, Pin/Signal Assignments

Pin	CCITT V.35 Symbol	Mnemonic	Input/ Output	Function
B	102	–	–	Signal ground
C	105	RTS	Input	Request-to-Send
D	106	CTS	Output	Clear-to-Send
E	107	DSR	Output	Data Set Ready
F	109	RLSD (DCD)	Output	Received Line Signal Detector
H	108	DTR	Input	Data Terminal Ready
P	103	TXD (A)	Input	Transmit Data
S	103	TXD (B)	Input	Transmit Data
R	104	RXD (A)	Output	Receive Data
T	104	RXD (B)	Output	Receive Data
U	113	ExTxC (A)	Input	External Transmit Clock
W	113	ExTxC (B)	Input	External Transmit Clock
V	115	RxC (A)	Output	Receiver Signal Element Timing
X	115	RxC (B)	Output	Receiver Signal Element Timing
Y	114	TxC (A)	Output	Transmitter Signal Element Timing
AA	114	TxC (B)	Output	Transmitter Signal Element Timing
NN	142	TM	Output	Test Mode

Connecting to the Dedicated Line

The Excalibur Multirate DAP provides an 8-pin modular jack labeled **DED** for connecting to the dedicated telephone line. The proper cable to use depends on the type of dedicated line outlet at your site:

- If the dedicated line outlet is an 8-pin modular jack, use Cable Part No. 5956-149G. This cable has 8-pin plugs at both ends.

- If the dedicated line outlet is a terminal block, use Cable Part No. 5956-158S. This cable has an 8-pin plug at one end and four spade lugs at the other end.

Both of these cables are provided with your DAP. Figure 3-4 shows both types of dedicated line connections. Table 3-3 lists the pin/signal assignments for the **DED** connector. (The leftmost pin is designated pin 1.)

SPECIAL NOTICE

Important governmental requirements are listed in the front of this manual. In order to comply fully with the rules of the government, carefully read these instructions before connecting to the telephone line, and where applicable, follow them completely.

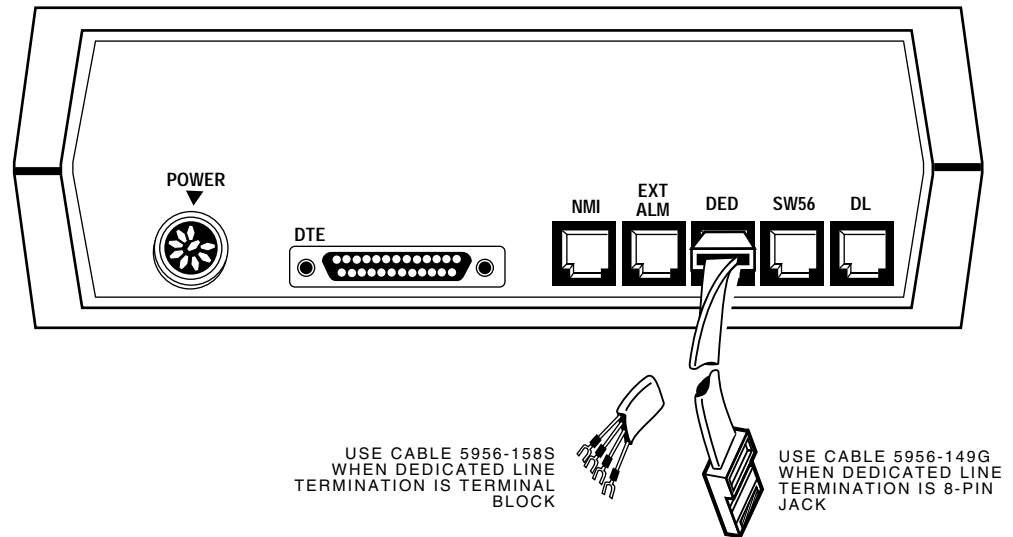


Figure 3-4. Dedicated Line Connection

Table 3-3. Dedicated Line Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Transmit Ring (R)	Output	Connection to the telephone line, transmit side.
2	Transmit Tip (T)	Output	Connection to the telephone line, transmit side.
3	No Connection	—	—
4	No Connection	—	—
5	No Connection	—	—
6	No Connection	—	—
7	Receive Tip (T1)	Input	Connection to the telephone line, receive side.
8	Receive Ring (R1)	Input	Connection to the telephone line, receive side.

Connecting to the Analog Dial-Up Line

The Excalibur Multirate DAP has an 8-pin modular jack labeled **DL** for connecting to the analog dial-up telephone line. The correct cable to use depends on the mode of operation selected and the telephone tariff used:

- For Programmable operation, use Cable Part No. 5956-149G-10. This cable has 8-pin modular plugs at both ends.
- For Permissive operation, use Cable Part No. 5956-149A-10. This cable has 6-pin modular plugs at both ends.

To connect to the dial-up line, plug one end of the cable into the **DL** connector and plug the other end into the telephone company's data jack. For programmable operation, request Data Jack USOC RJ45S (CA45A in Canada) from the telephone company. For Permissive operation, request Data Jack USOC RJ11C (CA11A in Canada)

Figure 3-5 shows the required dial line cable connections. Table 3-4 lists the pin/signal assignments for the DL connector. (The leftmost pin is designated pin 1.)

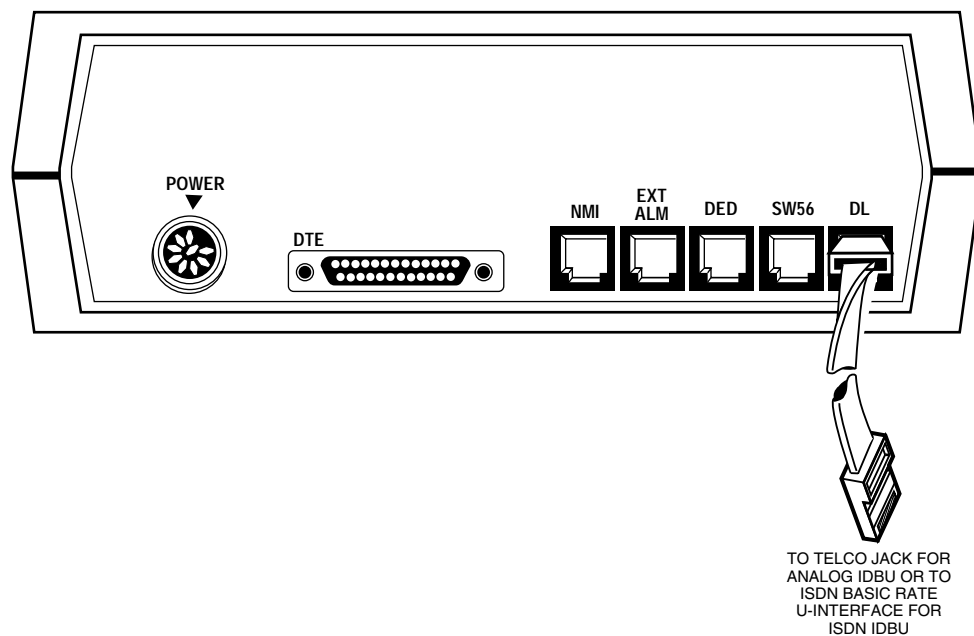


Figure 3-5. Analog or ISDN Dial Line Cable Connections

Table 3-4. Analog Dial Line Cable Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Not Used	—	—
2	Not Used	—	—
3	Not Used	—	—
4	Ring	Bidirectional	Connection to the dial line.
5	Tip	Bidirectional	Connection to the dial line.
6	Not Used	—	—
7*	Programming	Input	Used in Programmable Mode.
8*	Programming Common	Input	Used in Programmable Mode.

* These pins are used only when Programmable Mode is selected (RJ45S or CA45A).

Connecting to the ISDN Dial-UP Line

The Excalibur Multirate DAP has an 8-pin modular jack labeled **DL** for connecting to the ISDN dial-up telephone line. Contact your telephone company to determine the correct cable to use:

- Cable Part No. 5956-149G-10 - this cable has 8-pin modular plugs at both ends.
- Cable Part No. 5956-149A-10 - this cable has 6-pin modular plugs at both ends.

To connect to the dial-up line, plug one end of the cable into the **DL** connector and plug the other end into the telephone company's ISDN Basic Rate U-Interface. Figure 3-5 shows the required dial line cable connections. Table 3-5 lists the pin/signal assignments for the **DL** connector. (The leftmost pin is designated pin 1.)

Table 3-5. ISDN Dial Line Cable Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Not Used	—	—
2	Not Used	—	—
3	Not Used	—	—
4	Ring	Bidirectional	Connection to the dial line.
5	Tip	Bidirectional	Connection to the dial line.
6	Not Used	—	—
7	Not Used	—	—
8	Not Used	—	—

Connecting to the Switched 56 Dial-Up Line

The Excalibur Multirate DAP has an 8-pin modular jack labeled **SW56** for connecting to the Switched 56 dial-up telephone line. Contact your telephone company to determine the correct cable to use:

- Cable Part No. 5956-149G-10 - this cable has 8-pin modular plugs at both ends.
- Cable Part No 5956-158S-10 - this cable has an 8-pin modular jack at one end and four spade lugs at the other end.

To connect to the dial-up line, plug one end of the cable into the **SW56** connector and plug the other end into the telephone company's data jack. Figure 3-6 shows the required dial line cable connections. Table 3-6 lists the pin/signal assignments for the **SW56** connector. (The leftmost pin is designated pin 1.)

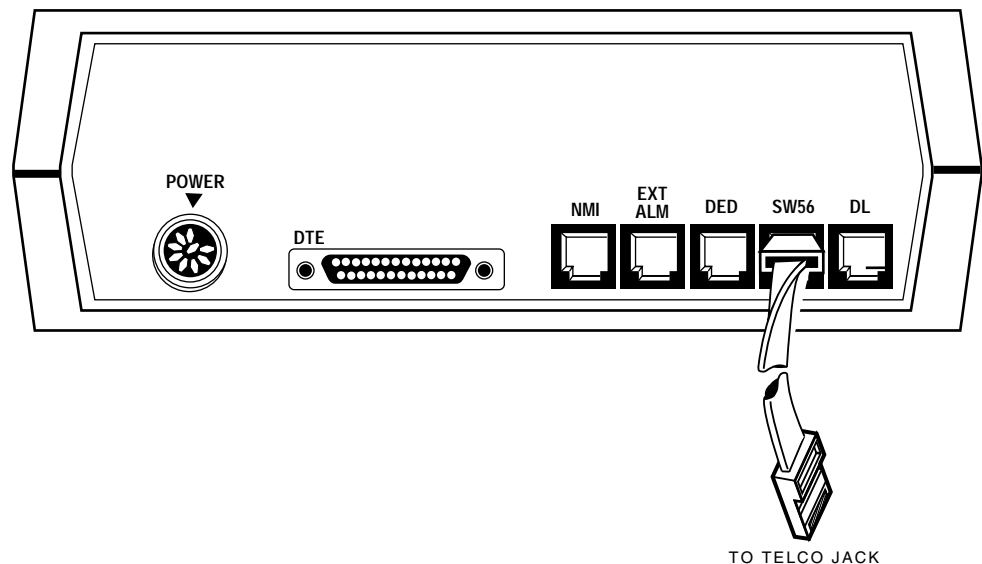


Figure 3-6. Switched 56 Dial Line Cable Connections

Table 3-6. Switched 56 Dial Line Cable Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Transmit Ring	Output	Connection to the telephone line, transmit side.
2	Transmit Tip	Output	Connection to the telephone line, transmit side.
3	Not Used	–	–
4	Not Used	–	–
5	Not Used	–	–
6	Not Used	–	–
7	Receive Tip	Input	Connection to the telephone line, receive side.
8	Receive Ring	Input	Connection to the telephone line, receive side.

Connecting to the CMS Network Management System

The Excalibur Multirate DAP provides a 10-pin jack labeled **NMI** for connecting to the CMS network management system. Use Cable Part No. 5956-158V which has a 10-pin plug at one end and a 6-pin plug at the other end to make this connection. When connecting to tail circuit equipment, use the following cables:

- When connecting a remote site Excalibur Multirate DAP to a tail circuit modem that has a SJ18 connector (such as an Omnimode), use Cable Part No. 5956-158W which has a 10-pin plug at one end and a 6-pin plug at the other end.
- When connecting a remote site Excalibur Multirate DAP to a tail circuit Excalibur Multirate DAP or an Excalibur 19.2 modem, use Cable Part No. 5956-149U which has 10-pin plugs at both ends.

These cables must be ordered from Milgo. Table 3-7 lists the pin signal assignments for the **NMI** connector. (The leftmost pin is designated pin 1.)

Table 3-7. Network Management System Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Not Used	–	–
2	Signal Ground	–	Common ground.
3	Secondary Channel Receive Data	Output	Serial data to CMS system.
4	Secondary Channel Data Carrier Detect	Output	Indicates that secondary channel signals are being received.
5	Power Fail Indicator	Output	If DAP loses power, it drops the signal on this pin. This alerts the connected device to the power failure.
6	Power Fail Detector	Input	A low signal on this pin indicates that the connected device has suffered a power failure.
7	Secondary Channel Request-to-Send	Input	Indicates CMS system is ready to transmit data.
8	Secondary Channel Transmit Data	Input	Serial data from CMS system.
9	Signal Ground	–	Common ground.
10	Not Used	–	–

Connecting to the Clear Secondary Channel

The **NMI** or the **DTE** connector can be used to connect to the Clear Secondary Channel when the interface connection is RS-232. When the interface connection is V.35, the **NMI** connector must be used.

To make this connection to the **NMI** connector, you must order Cable Part No. 5956-173C from Milgo. This cable has a 10-pin plug at one end and a RS-232 25-pin connector at the other end. This cable does not provide secondary channel CTS. The pin/signal assignments for this connector are listed in Table 3-8. (The leftmost pin is designated pin 1.)

To make this connection to the **DTE** connector, you must order Cable Part No. 5956-37C from Milgo. This cable has one RS-232 25-pin connector at one end that plugs into the DAP's RS-232 DTE connector and two (one for the primary channel, the other for the secondary channel) RS-232 25-pin connectors at the other end. This cable provides secondary channel CTS. The pin/signal assignments for this connector are identical to those listed in Table 3-1.

Table 3-8. Clear Secondary Channel (NMI) Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Not Used	–	–
2	Signal Ground	–	Common ground.
3	Secondary Channel Receive Data	Output	Serial data to the DTE.
4	Secondary Channel Data Carrier Detect	Output	Indicates that secondary channel signals are being received.
5	Not Used	–	–
6	Not Used	–	–
7	Secondary Channel Request-to-Send	Input	Indicates the DTE is ready to transmit data.
8	Secondary Channel Transmit Data	Input	Serial data from the DTE.
9	Signal Ground	–	Common ground.
10	Not Used	–	–

Connecting to an External Alarm

The Excalibur Multirate DAP provides a 10-pin jack labeled **EXT ALM** for connecting to an external alarm device (such as a burglar alarm or smoke detector). This enables an alarm device at a remote site to transmit an alarm through the secondary channel back to the central site.

To make this connection, you must order Cable Part No. 5956-178G from Milgo. One end of this cable has a 10-pin connector that plugs into the **EXT ALM** jack. The other end of this cable must be fitted with a connector appropriate to the alarm device at the time of installation. Table 3-9 lists the pin/signal assignments for this connector. (The leftmost pin is designated pin 1.)

Table 3-9. External Alarm Connector, Pin/Signal Assignments

Pin No.	Signal	Input/ Output	Function
1	Not Used	–	–
2	Not Used	–	–
3	Not Used	–	–
4	Not Used	–	–
5	Ground	–	Signal and supply ground.
6	External Alarm	Input	Active high external alarm.
7	Not Used	–	–
8	Not Used	–	–
9	External Alarm	Input	Active low external alarm.
10	Not Used	–	–

DMM Connector

Central site versions of the Excalibur Multirate DAP have an additional connector, labeled **DMM**, that is not provided on standalone units. This connector is typically used in central site applications to daisy-chain the CMS system diagnostic channel. Use Cable Part No. 5956-849U to connect the **DMM** connector on the first unit to the **NMI** connector on the next unit. Continue to daisy-chain units in the same manner: **DMM** to **NMI**.

Setting the Jumpers

The Excalibur Multirate DAP has six jumpers, labeled **JS1** to **JS6**, that define the functions of certain pins on the DTE connector for RS-232 operation. The dual interface DAP also has a 12-position shunt jumper that sets the interface to either RS-232 or V.35. The jumpers are located on the p.c. card. To access the jumpers, remove the DAP's top cover by following these steps:

1. Loosen the two screws located on the top of the unit. These screws should be loosened only to the point that they move freely up and down. Do not remove them completely from the unit.
2. Lift the front end of the unit with one hand and insert your thumbnail into the slot separating the front bezel and top half of the unit. (See Figure 3-7.)
3. Take a small flathead screwdriver in your free hand, and insert it behind one of the front edge corner tabs at a 45 degree angle (as shown in Figure 3-7). Press the tab outward, away from the unit, while pressing thumbnail upward until the top cover disengages from the interlocking tab.
4. Repeat Step 3 at the remaining three corners of the unit, and remove the top cover to expose the p.c. card.

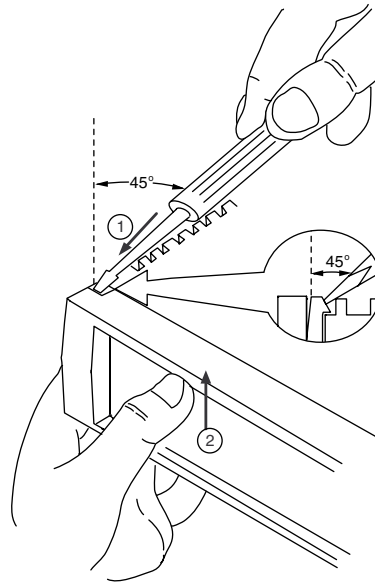


Figure 3-7. Removing Top Cover

The interface is factory set for V.35 with the 12-position shunt jumper installed on **X4 V.35**. To change the interface to RS-232, remove this jumper and install it on **X5 RS232** as shown in Figure 3-8.

Note: The Interface parameter in the DAP Configuration submenu must be set manually through the DAP's front panel to match the jumper setting.

Figure 3-8 shows the **JS1** to **JS6** jumper locations on the p.c. card. Table 3-10 lists each jumper setting and its respective function.

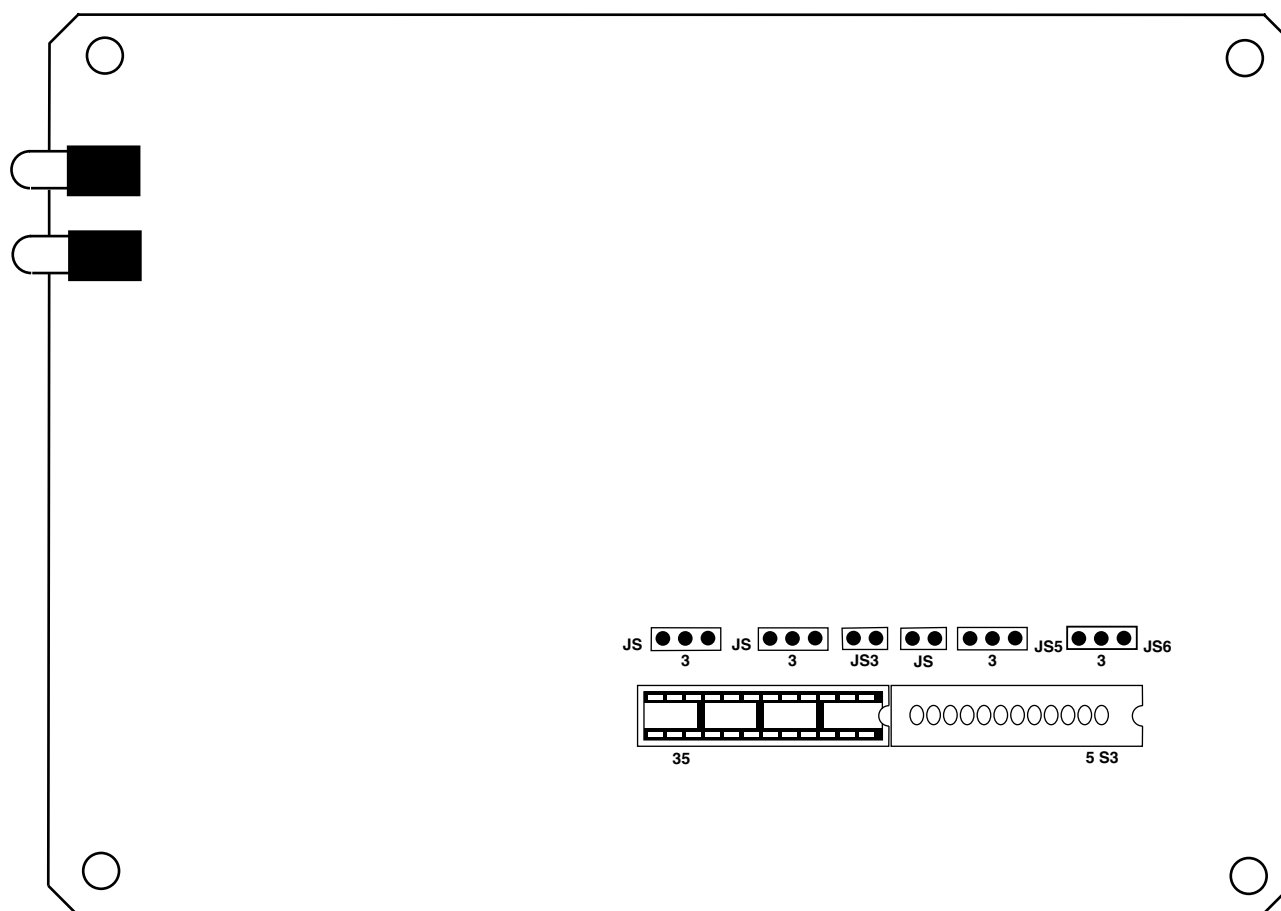


Figure 3-8. Jumper Locations

Table 3-10. Jumper Settings

Jumper	Setting	Function Selected
JS1	3 to 1	Pin 19 = Secondary channel RTS (input). Use for Clear Secondary Channel.
	3 to 2	Pin 19 = Digital Power Failure output. Use at central site unit.
JS2	3 to 1	Pin 23 = Signal Indicator (output). Active when the DDS line is available. Inactive when the DDS line is lost.
	3 to 2	Pin 23 = No function (input).
JS3	In	Pin 14 = Secondary channel transmit data is active (input). Typically used when the DAP is connected to a CMS system.
	Out	Pin 14 = Secondary channel transmit data is isolated. Typically used to isolate the secondary channel signals from the DTE.
JS4	In	Pin 16 = Secondary channel receive data is active (output). Typically used when the DAP is connected to a CMS system.
	Out	Pin 16 = Secondary channel receive data is isolated. Typically used to isolate the secondary channel signals from the DTE.
JS5	3 to 1	Pin 21 = Signal Quality (output).
	3 to 2	Pin 21 = Remote Digital Loop (input).
JS6	3 to 1	Pin 12 = Digital Power Failure input.
	3 to 2	Pin 12 = Secondary Channel DCD (output).

Note: If no connection to the DTE interface is desired, remove the jumper controlling the respective pin.

Setting the Pin Assignment Switches

Central site versions of the Excalibur Multirate DAP have three switchbanks, labeled **S1** to **S3**, that define the functions of certain pins on the DTE connector for RS-232 operation. The switchbanks are located on the Aggregate transition board. Table 3-11 lists the switch settings and respective functions for each switchbank.

Older standalone (Models 15-05A, 15-05B) and central site Excalibur Multirate DAPs equipped with a Model A (Part No. 15P0501A) or Model C (Part No. 15P0501C) Aggregate card have five switches, labeled **SW1** to **SW5**, that define the functions of certain pins on the DTE connector for RS-232 operation. On the standalone unit, these switches are located on the rear panel. On central site units, these switches are located on the Aggregate transition board. For the convenience of customers who have installed software upgrades only, Table 3-12 lists each switch setting and its respective function.

Table 3-11. Switchbank and Switch Settings

Switchbank and Switch Settings					Function Selected
S1	S2		S3		
1	1	2	1	2	
Up					Secondary channel control signals pass through the DTE connector. Typically used when the DAP is connected to a CMS system.
Down					Secondary channel control signals do not pass through the DTE connector. Typically used to isolate the secondary channel signals from the DTE.
	Up	Up			Pin 12 = Secondary Channel DCD; Pin 19 = Digital Power Failure output. Use at central site unit.
	Down	Down			Pin 12 = Digital Power Fail input; Pin 19 = Secondary Channel RTS. Use at remote site unit.
	Up	Down			Pin 12 = Secondary Channel DCD; Pin 19 = Secondary Channel RTS. Use for Clear Secondary Channel.
			Up		Pin 23 = No function (input).
			Down		Pin 23 = Signal Indicator (output). Active when the DDS line is available. Inactive when the DDS line is lost.
				Up	Pin 21 = Remote Digital Loop (input).
				Down	Pin 21 = Signal Quality (output).

Table 3-12. Switch Settings, Older Standalone and Central Site DAPs

Switch					Function Selected
SW1	SW2	SW3	SW4	SW5	
Up					Secondary channel control signals pass through the DTE connector. Typically used when the DAP is connected to a CMS system.
Down					Secondary channel control signals do not pass through the DTE connector. Typically used to isolate the secondary channel signals from the DTE.
	Up	Up			Pin 12 = Secondary Channel DCD; Pin 19 = Digital Power Failure output. Use at central site unit.
	Down	Down			Pin 12 = Digital Power Fail input; Pin 19 = Secondary Channel RTS. Use at remote site unit.
	Up	Down			Pin 12 = Secondary Channel DCD; Pin 19 = Secondary Channel RTS. Use for Clear Secondary Channel.
			Up		Pin 23 = No function (input).
			Down		Pin 23 = Signal Indicator (output). Active when the DDS line is available. Inactive when the DDS line is lost.
				Up	Pin 21 = Remote Digital Loop (input).
				Down	Pin 21 = Signal Quality (output).

Aggregate Transition Board Headers

The RS-232 Aggregate transition board has four headers, labeled **X1** to **X4**, that come from the factory set as follows. Do NOT change these settings.

<u>Header</u>	<u>Setting</u>	<u>Selection</u>
X1	Out	Not Used
X2	In	Single Port
X3	Out	Not Used
X4	In	Single Port

The V.35 Aggregate transition board has six headers, labeled **X1** to **X6**, that come from the factory set as follows. Do NOT change these settings.

<u>Header</u>	<u>Setting</u>	<u>Selection</u>
X1	Out	Not Used
X2	In	Single Port
X3	Out	Not Used
X4	In	Single Port
X5	Out	Clear Secondary Channel
X6	In	CMS

Digital Bridge Board

Central site versions of the Excalibur Multirate DAD operate with a Digital Bridge Board (DBB). The DBB is a special transition board designed for the DAD and the EDRS Dial Backup Resource (DBR). Two types of DBB are available: RS-232 and V.35. The DBB plugs into the back of the Excalibur Card Carrier.

Switch and Header Settings

Each DBB has a 4-position switchbank, labeled **S1**, and four header sockets, labeled **X3** to **X6**, that are preset to operate with the type of unit it is shipped with: singleport DAD, multiport DAD, or DBR. Before you install the DBBs for the singleport DADs, verify that these switches and headers are set as follows:

- Switchbank **S1**, Switches 1 to 4 should all be set On.
- Headers should be installed in the **X3** and **X5** sockets. Sockets **X4** and **X6** should be empty.

Figure 3-9 shows the locations of the switchbank and headers.

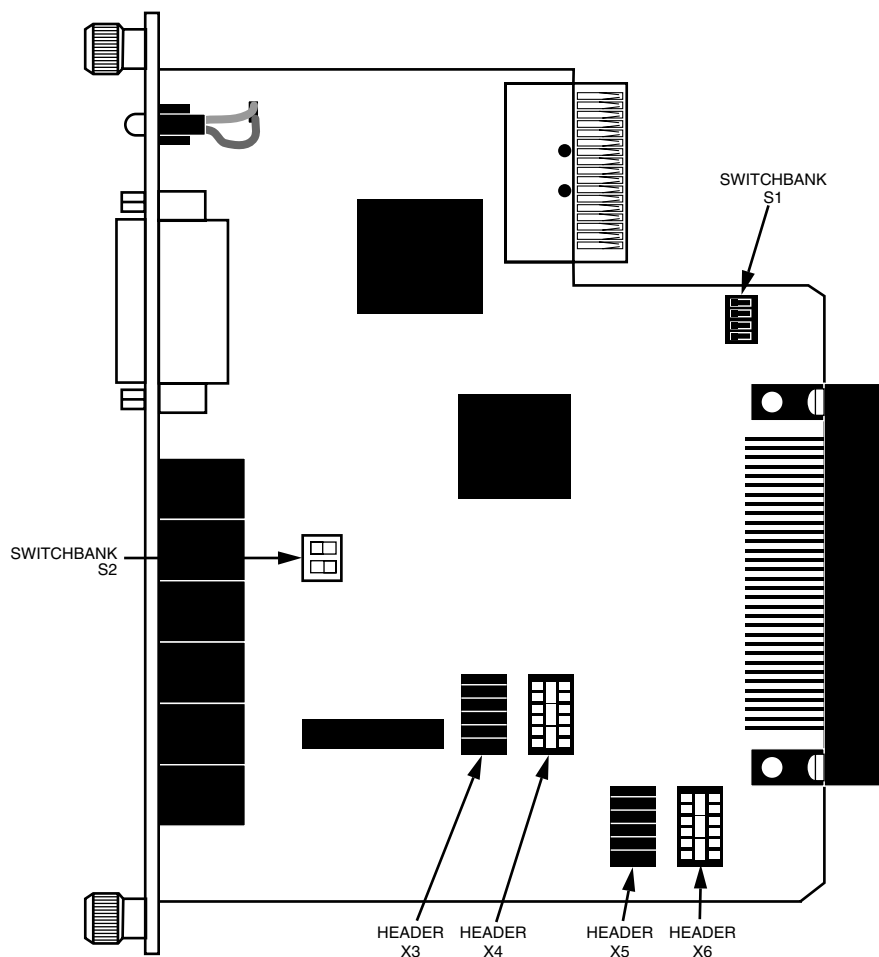


Figure 3-9. DBB Switchbank and Header Locations

On RS-232 DBBs, an additional 2-position switchbank, labeled **S2**, allows you to define the functions of certain pins on the DTE connector. The settings and respective functions for the two switches are as follows:

- Switch 1 - On: Pin 21 = Remote Digital Loop (input)
- Switch 1 - Off: Pin 21 = Signal Quality (output)
- Switch 2 - On: Pin 23 = Data Rate Select (input)
- Switch 2 - Off: Pin 23 = Data Rate Indicator (output)

Connectors

The interface connectors for the DAD are arranged vertically on the DBB, as shown in Figure 3-10.

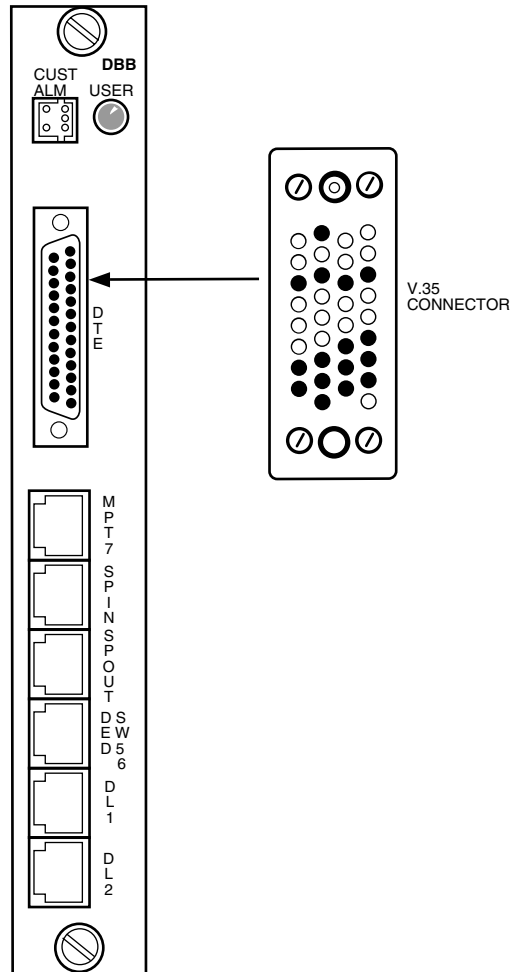


Figure 3-10. DBB Connectors

These connectors are used as follows:

- **CUST ALM** - Allows you to connect to an external alarm source. This connector replaces the 10-pin jack labeled **EX AL** on the standard transition board. To make this connection, use Cable No. 5956-165M. (This cable must be ordered separately from Milgo.) On this connector, Pin 1 (top right) is the high true (+5V) alarm input and pin 4 (top left) is the low true (0V) alarm input. Pin 2 (middle right) is the ground.

- **DTE** - Allows you to connect to the DTE. See "Connecting to the DTE" section for instructions.
- **MPT7** - Not used.
- **SPIN** - Not used.
- **SPOUT** - Not used.
- **DED/SW56** - Allows you to connect to the dedicated telephone lines. See "Connecting to the Dedicated Line" section for instructions.
- **DL1** - Not used.
- **DL2** - Not used.

The **NMI** and **DMM** connectors on the standard transition board are not included on the DBB. Connection to the CMS 400 network management system is made through the Excalibur Card Carrier's Cage Input/Output (I/O) Card. The CMS control signals are routed to the DBBs through a bus on the chassis backplane.

User Indicator

Each DBB has a LED indicator, labeled **USER**, that lights continuously while its associated DAD is participating in a dial restoral activity. It flashes while the DAD is selected by the control panel.

AC Power Connection

The Excalibur Multirate DAP draws power from a 92-127 VAC external power supply that plugs directly into your AC power outlet. To make this connection, plug one end of the power supply cable into the DAP's **POWER** receptacle and plug the other end into the AC outlet. Figure 3-11 illustrates this connection.

Note: If there is a snap-on ferrite in the package containing this manual and the cables, it must be attached to the DC power cable as close to the DAP as possible. See Figure 3-11. The ferrite must be installed to comply with FCC Part 15 Requirements. If the ferrite is not included in the package, it is not needed.



Caution: For use with Power Supply Part No. 25C168-01.

Pour utiliser avec alimentation.

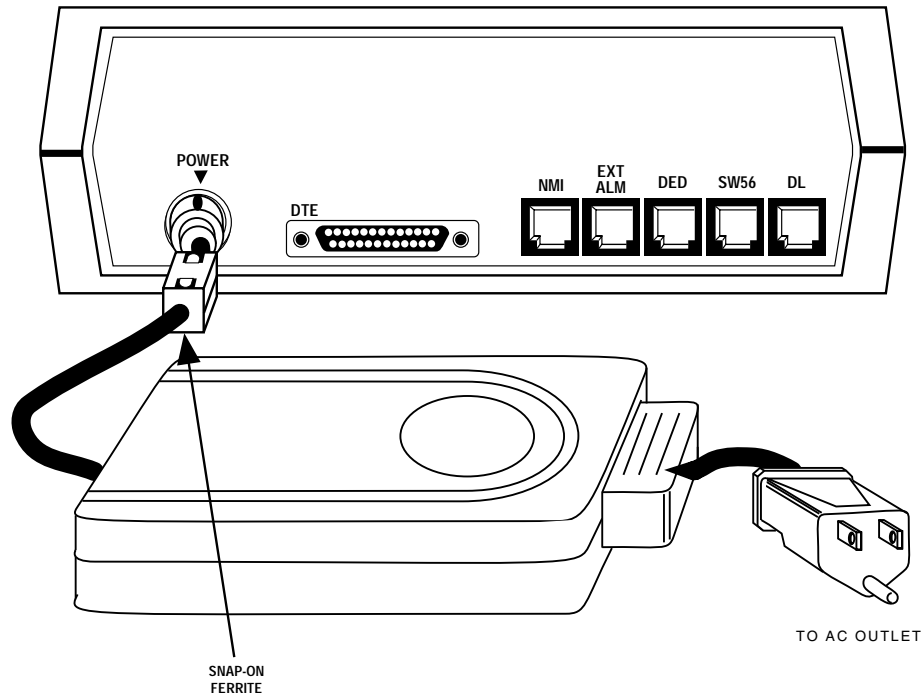


Figure 3-11. Power Supply Connection

Calibration

If your unit is equipped with a Model A or C Aggregate card, you must calibrate the transmitter whenever the power supply is changed. To perform this procedure, disconnect the cable from the dedicated line connector, labeled **DED**. From the front panel, enter the DAP submenu under the Configuration menu. Press the **Accept** button under the TxCal parameter. When calibration is complete, reinstall the dedicated line cable.

Chapter 4

Using the Front Panel

Overview

This chapter is designed to familiarize you with the Excalibur Multirate DAP front panel. It describes the functions of all buttons and LED indicators, shows you what you will see when you first plug in the DAP, and explains how to move through the menus to enter commands. It also contains instructions on entering unit addresses, establishing password protection, and testing the front panel buttons and indicators.

Front Panel Components

The Excalibur Multirate DAP front panel contains eight pushbuttons, two LED indicators, and a 48-character LCD screen. Figure 4-1 illustrates the front panel and describes the functions of its various components.

The front panel provides an audible beeper that you can enable or disable as desired. The beeper can be configured to sound every time a button is pushed and/or an alarm is reported. It can also be disabled completely. (For instructions, see "Beeper" in Chapter 5.)

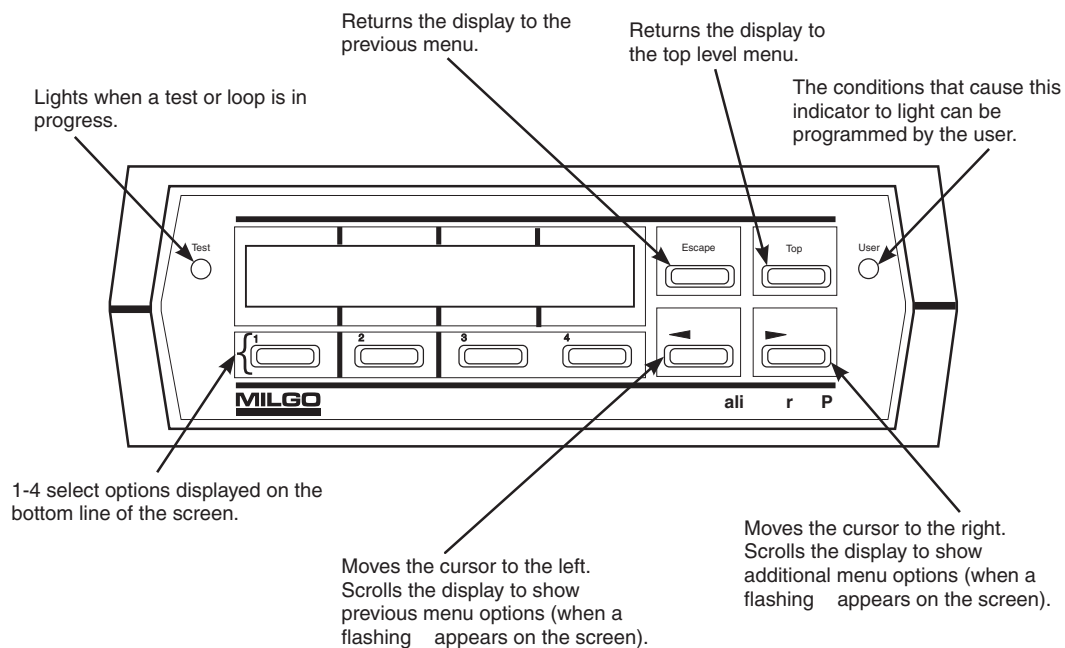


Figure 4-1. Excalibur Multirate DAP Front Panel

What You Will See First

When you plug in the Excalibur Multirate DAP, it performs a power-up self-test. When this test is completed, the LCD screen displays the following message: Pwr-Up Initialization Completed, Press ESC.

When you press the **Escape** button, the screen displays the Top Level menu. (See Figure 4-2.) A T (for top) appears in the upper left corner of the screen.

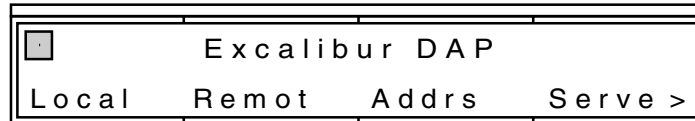


Figure 4-2. Top Level Menu

Moving Through the Menus

The Top Level menu is the starting point for entering all commands. You can access this menu from any other menu by pressing the **Top** button.

As with all Excalibur Multirate DAP menus, the Top Level menu consists of two lines. The top line displays the name of the DAP, while the bottom line displays the possible options you can select. The top line displays `Excalibur DAP` for units without dial backup, `DAP +4W 56K DBU` for units equipped with the Switched 56 IDBU feature, `DAP + 2 wire 14.4K DBU` for units equipped with the Analog IDBU feature, or `DAP + ISDN DBU` for units equipped with the ISDN IDBU feature. (You can place any name in the top line by setting the Alias parameter.) The Top Level menu lets you select from the following options:

- `Local` - places the DAP into Local Mode. This is the normal mode of operation. An L (for local) is displayed in the upper left corner of all screens when in Local Mode.
- `Remot` - places the DAP into Remote Mode. When using the interruptive secondary channel (Basic DDS), the Remote Mode will cause main channel data to be interrupted. In Remote Mode, you can control any remote Excalibur DAP in the circuit from the local unit's front panel. (See "Entering Unit Addresses" in this section for instructions on how to define which remote unit is controlled.) An R (for remote) appears in the upper left corner of all screens when in Remote Mode.

The Remote option does not appear on the screen when any of the following parameters are set:

1. The Service parameter is set to CC64.
2. The Controller parameter is set to No in the RCP Configuration submenu.
3. The Secondary Channel Format parameter is set to anything other than Excal.
4. The Service parameter is set to DDS and the Local Diagnostics parameter is set to Disable.
5. The Service parameter is set to DDSNI, DDSSC, LADC, LDM, or C64NI and the Secondary Channel Mode parameter is set to ClrSC (Clear Secondary Channel).

Note: LADC is only available for units equipped with the Model A or C Aggregate card.

- **AddrS** - allows you to define the local DAP address and the addresses required for proper Remote Mode operation.
- **Serve** - allows you to choose a digital data service or your own copper wire (LDM).
- **FPTst** - allows you to verify the operation of the front panel buttons and indicators. (To access this option, you may need to press the > button.)
- **RTN** - allows you to return the local or remote DAP to normal operating mode from a testing mode and allows you to clear alarms. If the unit is equipped with an IDBU option, it also allows you to reset the Automatic Dial Backup Retrieves function.
- **ALNet** - stands for Auto-Learn Network. This feature allows you to make the central unit automatically learn the T7 address of all the remote units on the multidrop line. This option appears on the screen only when the Service parameter is set to DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to enabled in the DAP Configuration submenu.

To select an option, simply press the button (1 - 4) beneath it. The screen then displays a submenu with a new set of options. Whenever the screen cannot fit all options on a single display, it displays a flashing > arrow in the lower right corner. To display the additional options, press the > button. A flashing < arrow then appears in the lower left corner of the screen. This indicates that you can display the previous options again by pressing the < button.

Each time you select an option, a new submenu appears, until the lowest level menu is reached, and the command is executed. To return from any menu to the previous menu, press the **Escape** button.

Status Display

Whenever two minutes elapse without a button being pressed, the LCD screen dims (to reduce power consumption). Whenever an additional 58 minutes elapse without a button being pressed, the Status Display appears. (See Figure 4-3.) This display remains on the screen until you press the **Escape** button or the **Top** button.

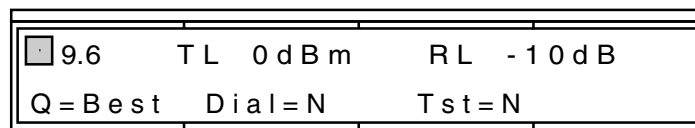


Figure 4-3. Status Display

The Status Display gives you a "snapshot" of the DAP's current operating status. The following status conditions are shown:

- 9.6 - indicates the DAP's operating speed (9.6 Kbps). Possible displays range from 2.4 to 64 Kbps. Actual speeds displayed are dependent on the service used.
- T L - shows the DAP's transmit level in dBm. The transmit level is fixed for units equipped with the 15P09AA-1 or Model D Aggregate card.
- R L - shows the DAP's approximate receive level insertion loss range in -dB for units equipped with the 15P09AA or Model D Aggregate card. For example, -11 dB indicates the received signal is less than 11 dB. For units equipped with the Model A or C Aggregate card, it shows the DAP's receive level in -dB.
- Q - shows the quality of the signal received from the telephone line. Receiving any network control code, a loss of multiport frame, and unknown network control codes will cause the signal quality to degrade. Possible displays are Best, Good, Fair, Poor, and Off.
- D i a l - indicates whether the DAP is in dial backup operation. If the unit is not equipped with the Analog, Switched 56, or ISDN IDBU option, Svc is displayed in place of Dial. Svc - shows the digital data service, LADC, or LDM line used. Possible displays are DDS, DDSNI, DDSSC, LADC, LDM, CC64, and C64NI.
- T s t - indicates whether a test is in progress.

Note: LADC only appears on the screen for units equipped with the Model A or C Aggregate card.

Entering Unit Addresses

For the Remote Control Panel (RCP) feature to operate properly, you must assign a unique address to each Excalibur Multirate DAP in the circuit. The address can be any 3-digit number between 001 and 255.

There are two different addresses that must be entered into each unit:

- Local - the address of the local DAP.
- Remote - the address of the DAP you wish to control when operating in Remote Mode.

To enter these addresses, follow these steps, starting from the Top Level menu:

Note: In the illustrations that follow, the shading indicates which button to press.

1. Press the button beneath Addr.s.


T Excalibur DAP				Escape	Top
Local	Remot	Addr.s	Serve >		
			4		

2. Press the button beneath the address you wish to set. The screen then displays the current address in the top line with a cursor under the rightmost digit.

Drop Address				Escape	Top
Local	Remot				
			4		

If you are setting a DAD address, follow Step 3. If you are setting a DAP address, skip to Step 4.

3. Press the button beneath Unit.

L		Local Drop Address				
ESC	Unit Chanl				TOP	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

4. To increase the digit, press the **1** button; to decrease it, press the **2** button. When you change a digit, a reverse video C appears in the lower right corner of the screen.

L Local Unit Number = 001				Escape	Top
Inc	Dec	Accpt			
1	2	3	4	<	>

5. When the rightmost digit is set, press the < button to move the cursor to the center digit. Then repeat Step 3 to set the digit. Continue in this manner until the desired address is displayed.

L Local Unit Number = 002				Escape	Top
Inc	Dec	Accpt			
1	2	3	4	<	>

6. Press the **3** button to enter the address into memory.

L Local Unit Number = 012				Escape	Top
Inc	Dec	Accpt			
1	2	3	4	<	>

Assigning NCP Channel

The central site Excalibur Multirate DAD contains an additional address you must set called the NCP (network control protocol) channel. This address assigns the DAD to one of seven network management channels on the Cage I/O Card's **NMI** connector. The **NMI** connector is a 20-pin interface that connects to up to eight network management channels on a CMS 400 EDM. Channels 2 to 8 are 75 bps channels that allow the CMS 400 to control the DADs in the system. Channel 1 is a 4800 bps channel that is used strictly for EDRS control. Do not assign a DAD to Channel 1.

To enter this address, follow these steps, starting from the Top Level menu:

1. Press the button beneath **Addr.s**.

<div> <div>T</div> <div>Excalibur DAD</div> </div>						
ESC	Local Remot Addr.s Serve>				TOP	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

2. Press the button beneath **Local**.

<div> <div>L</div> <div>Drop Address</div> </div>						
ESC	Local Remot				TOP	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

3. Press the button beneath **Chan1**.

<div> <div>L</div> <div>Local Drop Address</div> </div>						
ESC	Unit Chan1				TOP	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

4. You can now set this address the same way you would set the local and remote addresses.

<div> <div>L</div> <div>Local NCP Channel=002</div> </div>						
ESC	Inc Dec Acpt				TOP	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Establishing Password Protection

The Excalibur Multirate DAP allows you to establish password protection over any or all of the following front panel functions: configuration (including secondary channel configuration), diagnostic testing, remote control panel, dial backup, Digital Data Service Mode, and the T7 address. To establish password protection, you must enter the correct password and then lock the desired front panel functions. When a function is locked, the operator must enter the correct password to unlock it.

If your DAP is equipped with the Analog or the ISDN IDBU feature, you can establish a security identification code for dial backup operation. The code can be any 4-digit number from 0001 through 9999. When the answering unit has this feature enabled during dial backup operation, the calling unit must have the same 4-digit code or the units will not switch to dial backup operation.

Entering the Password

When the Excalibur Multirate DAP is shipped from the factory, the predefined password is **RMI**. To enter this password, follow these steps, starting from the Top Level menu:

1. Press the **1** or **2** button depending on which DAP (local or remote) you wish to establish password protection for.

<div> <div>T</div> <div>Excalibur DAP</div> </div>				Escape	Top
Local	Remot	Addr s	Serve >	<	>
1	2	3	4		

2. Press the > button.

<div> <div>L</div> <div>Local Mode</div> </div>				Escape	Top
Stats	Confg	Diag	Dial >	<	>
1	2	3	4		

3. Press the button beneath Secur.

<div> <div>L</div> <div>Local Mode</div> </div>				Escape	Top
<div> <div>< Dial</div> <div>Call</div> <div>Secur</div> </div>					
1	2	3	4	<	>

4. Press the **1** and **2** buttons to enter the desired character in each space. Press the < and > buttons to move from space to space.

Note: The predefined password must be entered in uppercase letters.

<div> <div>L</div> <div>Security Password=</div> </div>				Escape	Top
<div> <div>Inc</div> <div>Dec</div> <div>Acpt</div> <div>Other</div> </div>					
1	2	3	4	<	>

5. When the correct password is displayed, press the **3** button. The screen then displays the Security Mode menu. (DBSec and SecID appear on the screen only for units equipped with the Analog or the ISDN IDBU option. They are applicable only when the Dial Mode is set to BIS+ for Analog IDBU or to EISDN for ISDN IDBU.)

<div> <div>L</div> <div>Security Password=RM</div> </div>				Escape	Top
<div> <div>Inc</div> <div>Dec</div> <div>Acpt</div> <div>Other</div> </div>					
1	2	3	4	<	>

<div> <div>L</div> <div>Security Mode</div> </div>			
<div> <div>ChgPw Lock</div> <div>DBSec</div> <div>SecID</div> </div>			

Changing the Password

If you wish to change the predefined password, enter the Security Mode menu and press the button beneath ChgPw. You can then define a new password in the same manner described in Steps 4 and 5 above.

Locking Front Panel Functions

The Lock feature allows you to prevent unauthorized personnel inter-vention. When a function is locked, it can not be accessed from the front panel. To lock front panel functions, enter the Security Mode menu and follow these steps:

- 1. Press the button beneath Lock.

<div><div>L</div><div>Security Mode</div><div>ChgPwLockDESecSecID</div><div>1234</div></div>				Escape	Top
				<	>

- 2. Press the button beneath the function(s) you wish to lock: Config (configuration), Diag (diagnostics), RCP (Remote Control Panel), Dial (dial backup), SecCh (secondary channel configuration), Serve (Digital Data Service Mode) or Addr (T7 address). The function is then erased from the screen, indicating it is now locked.

<div><div>L</div><div>Lock-out Mode</div><div>ConfigDiagRCPDial></div><div>1234</div></div>				Escape	Top
				<	>

<div><div>L</div><div>Lock-out Mode</div><div>ConfigDiagDialSecCh></div></div>			
---	--	--	--

When a function is locked, it is no longer displayed in the menu in which it normally appears, thus preventing unauthorized personnel intervention. For example, if you lock the Remote Control Panel function, Remot no longer appears in the Top Level menu.

Note: It is recommended that you lock all front panel functions to prevent unauthorized access.

Unlocking Front Panel Functions

To unlock a function so that it reappears in the menu, you must enter the Security Mode menu as previously described. Then follow these steps:

1. Press the button beneath **Unloc**.

<div> <div>L</div> Security Mode </div>				Escape	Top
<div> ChgPw Lock Unloc DSec > </div>				<	>
1	2	3	4		

2. Press the button beneath the function you wish to unlock. The screen then indicates that the function is unlocked.

<div> <div>L</div> Unlock Mode </div>				Escape	Top
<div> Serve </div>				<	>
1	2	3	4		

<div> <div>L</div> All Menus are UNLOCKED </div>			
<div> Press ESC </div>			

Establishing a Security Code

To establish a dial backup security identification code for the Analog or the ISDN IDBU feature, enter the Security Mode menu and follow these steps:

1. Press the button beneath **SecID**.

<div> <div>L</div> Security Mode </div>				Escape	Top
<div> ChgPw Lock DSec SecID </div>				<	>
1	2	3	4		

2. Press the **1** and **2** buttons to enter the desired character in each space. Press the **<** and **>** buttons to move from space to space.

Security ID = 0000				Escape	Top
Inc Dec Accpt					
1	2	3	4	<	>

3. When the desired security identification code is entered, press the **3** button. The screen then displays the Security Mode menu.

Security ID = 6364				Escape	Top
Inc Dec Accpt					
1	2	3	4	<	>

Security Mode			
ChgPw	Lock	DBSec	SecID

To enable this feature, follow these steps:

1. Press the button beneath DBSec.

Security Mode				Escape	Top
ChgPw Lock DBSec SecID					
1	2	3	4	<	>

- Press the **1** button. The top line of the screen displays the new setting.

<div> <div>L</div> <div>Dial Security = Disabled</div> </div>				Escape	Top
<div> <div>Enabl</div> <div>Disab</div> </div>					
1	2	3	4	<	>

<div> <div>L</div> <div>Dial Security = Enabled</div> </div>			
<div> <div>Enabl</div> <div>Disab</div> </div>			

Front Panel Test

The Excalibur Multirate DAP allows you to verify that all front panel buttons and indicators are working properly. To do so, follow these steps, starting from the Top Level menu:

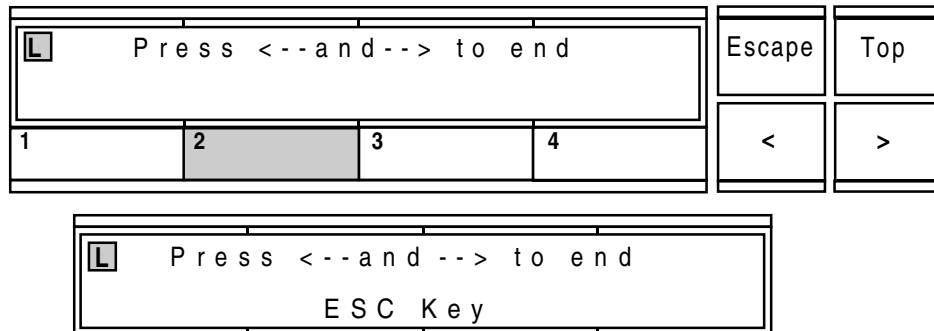
- Press the **>** button.

<div> <div>T</div> <div>Excalibur DAP</div> </div>				Escape	Top
<div> <div>Local</div> <div>Remot</div> <div>Addrs</div> <div>Serve ></div> </div>					
1	2	3	4	<	>

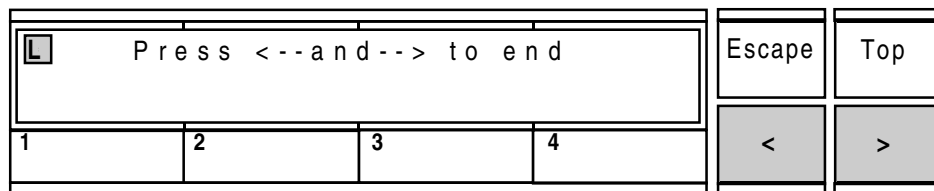
- Press the button beneath **FPTst**. The screen goes dark for 3 seconds (so you can check for character spaces that are always off) and then goes blank for 3 seconds (so you can check for character spaces always on).

<div> <div>T</div> <div>Excalibur DAP</div> </div>				Escape	Top
<div> <div>< Serve</div> <div>PTst</div> <div>RTN</div> <div>ALNet</div> </div>					
1	2	3	4	<	>

- Press any front panel button that you wish to verify. The screen displays the name of the button pressed on the bottom line. If you press buttons **1 - 4**, the **Test** indicator lights. If you press any other button, the **User** indicator lights.



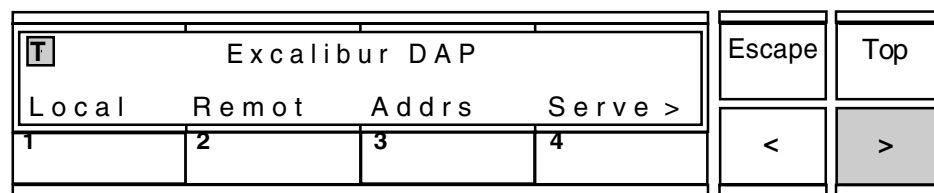
- To return to the Top Level menu, press the < and > buttons simultaneously. (The display automatically returns to the Top Level menu if no buttons are pressed for 5 seconds.)



Auto-Learn Network

This feature allows you to make the central unit automatically learn the T7 address of each remote unit on the multidrop circuit. This option appears on the screen only when the Service parameter is set to DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to enabled in the DAP Configuration submenu. To activate this function, follow these steps, starting from the Top Level menu:

- Press the > button.



2. Press the button beneath ALNet.

<div> <div>T</div> <div>Excalibur DAP</div> </div>				Escape	Top
<div> <div>< Serve</div> <div>PTst</div> <div>RTN</div> <div>ALNet</div> </div>				<	>
1	2	3	4		

3. Press the button beneath Ok. The DAP clears its internal list of remote drops and then adds them all again. The display returns to the Top Level menu.

Note: This function is interruptive to customer data.

<div> <div>L</div> <div>Network will be reset</div> </div>				Escape	Top
<div> <div>Ok</div> </div>				<	>
1	2	3	4		

Event Displays

Whenever a significant event occurs (such as an alarm being activated), the DAP alerts you by displaying an event message on the screen. (See Figure 4-4.) The upper left corner of the screen toggles a reverse video E with the character normally displayed (T, L, or R). The upper right corner of the screen displays the event number, which indicates the order in which the event occurred. The first event to occur is designated E1, the second E2, and so on up to E5. If more than five events occur, E* appears and earlier messages are overwritten. To view earlier events, press the **Escape** button. When no more events are stored, the screen returns to the current menu selection. If you wish to return to the Top Level menu without viewing all the stored events, press the **Top** button.

If an event occurs while you are in the Configuration menu, the screen displays the toggling E in the upper left corner, but does not display the event message. To display the message, press the **Escape** button until you exit the Configuration menu, and then proceed as previously described.

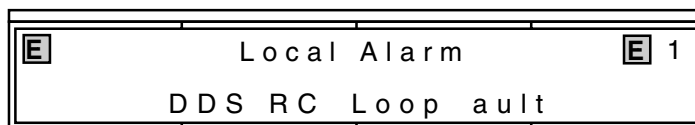


Figure 4-4. Event Displays

Chapter 5

Defining Operating Parameters

Overview

This chapter explains how to configure the DAP's operating parameters to suit your particular network requirements. The beginning of the chapter contains step-by-step instructions that show you how to define operating parameters using the front panel buttons and display. The remainder of the chapter describes the parameters in detail. It contains tables that list each parameter and its possible settings, followed by descriptions of each parameter that help you decide which setting is correct for your application.

Entering the Service Menu

The first DAP operating parameters that must be defined are the service and the DTE speed. To define these parameters, you must enter the Service menu. To do so, follow these steps, starting from the Top Level menu:

Note: In the illustrations that follow, the shading indicates which button to press.

1. To enter the Service menu, press the **4** button.

Excalibur DAP				Escape	Top
Local	Remot	Addr	Serve >		

2. The screen displays the current service setting and possible options. (Press the > button to display additional options.) This parameter setting must correspond with your dedicated line connection. Press the button beneath the correct service.

Service = DDS				Escape	Top
DDS	DDSNi	DDSSC	LDM >		

For all services except DDSNI and C64NI, the line rate will equal the DTE rate. The maximum main channel (DTE) data rates for DDSNI and C64NI services are listed in Table 5-1. For DDSNI and C64NI you can also set the DTE interface to operate at a lower data rate than the DDS line rate when Rate Adaption is enabled. See "Port Rate Configuration" in this chapter for a complete description of this feature.

If you wish to set the service for DDSNI or C64NI, skip to Step 4. For all other services, follow Step 3.

- 3. The screen now displays the current line rate and possible options. Press the button beneath the desired setting. The top line of the screen displays the service and the bottom line of the screen displays the new line rate and maximum DTE rate.

<input type="checkbox"/> Data Rate = 9600				Escape	Top
56000	19200	9600	4800 >		

<input type="checkbox"/> Service = DDS	
Rate=56.0 Usable=56.0	

Press the **Escape** button twice to return to the Service menu.

- 4. Press the button beneath DDSNI or C64NI.

<input type="checkbox"/> Service = DDS				Escape	Top
DDS	DDSNI	DDSSC	LDM >		

5. Press the button beneath Rate.

<input type="checkbox"/> DDSNI Configuration				Escape	Top
Rate MPFrm					

6. The screen now displays the current line rate and possible options. Press the button beneath the desired setting. The top line of the screen displays the service and the bottom line of the screen displays the new line rate and maximum DTE rate.

<input type="checkbox"/> Data Rate = 9600				Escape	Top
56000	19200	9600	4800 >		

<input type="checkbox"/> Service = DDSNI	
Rate=56.0 Usable=52.8	

Press the **Escape** button twice to return to the DDSNI Configuration submenu.

7. Press the button beneath MPFrm. When this parameter is enabled your unit can be connected to a multidrop network made up of Excalibur Multiport DAPs, and can interface to any one channel in the aggregate data stream. The DAP can operate as a multidrop central or remote.

<input type="checkbox"/> DDSNI Configuration				Escape	Top
Rate MPFrm					

8. Press the button beneath the desired option. The top line of screen displays the new setting.

<input checked="" type="checkbox"/> Multiport Frame = Disabled				Escape	Top
Enabl Disab					
1	2	3	4	<	>

<input checked="" type="checkbox"/> Multiport Frame = Enabled			
Enabl Disab			

Table 5-1. DDSNI and C64NI DTE Rates

DDS Line	Maximum DTE Rate
2.4 Kbps	2.1 Kbps
4.8 Kbps	4.5 Kbps
9.6 Kbps	9.0 Kbps
19.2 Kbps	18.0 Kbps
56.0 Kbps	52.8 Kbps
64.0 Kbps	57.6 Kbps

Entering the Configuration Menu

To define the rest of the DAP's operating parameters, you must enter the Configuration menu. To do so, follow these steps, starting from the Top Level menu:

- 1. To configure the local DAP, press the **1** button. To configure the remote DAP, press the **2** button.

Excalibur DAP				Escape	Top
Local	Remot	Addr	Serve >		
1	2	3	4	<	>

- 2. Press the **2** button to enter the Configuration menu.

local Mode				Escape	Top
Sats	Onfg	Diag	Dial >		
1	2	3	4	<	>

- 3. The screen now displays the first four parameter submenus. Press the **>** button to scroll through the remaining submenus.

Note: Several parameters in the Configuration menu are dependent upon the service used. A parameter that is not applicable to the service you are connected to will not be displayed.

Configuration Mode				Escape	Top
DAP	Alias	RCP	PRate >		
1	2	3	4	<	>

Configuration Mode			
Rate	Dial	Thrs	Chnl >

Configuration Mode			
Chnl	User	System	

The submenus are defined as follows:

- **DAP** - allows you to set basic DAP parameters and configure the DAP to the DTE's operating characteristics.
- **Alias** - allows you to assign an alphanumeric name to the DAP.
- **RCP** - allows you to set parameters related to the Remote Control Panel and Test Compatibility features. If the unit is equipped with the Analog or ISDN IDBU feature, it also allows you to set the unit to route secondary channel data over the dial backup lines while transmitting primary channel data over the dedicated lines.
- **PRate** - allows you to set the DTE interface to operate at a lower data rate than the DDS line rate.
- **Dial** - allows you to set the parameters related to the Analog, Switched 56, or ISDN Dial Backup feature.
- **Thrsh** - allows you to define the thresholds for five line parameters and the Excessive Resynchronizations parameter. It allows you to set the timers for the Lost Communication and Regained Communication alarms. It also allows you to enable/disable the RTS/DCD antistreaming function and the DTE Power Fail alarm for each port or shared group.
- **Chnnl** - allows you to set parameters related to the Multiport Framing feature.
- **User** - allows you to define a set of conditions that will cause the front panel **User** LED to light and allows you to turn off the **User** LED when it is lit.
- **System** - allows you to store a parameter configuration and swap it with the current configuration. It also allows you to replace the current parameter configuration with the factory default settings and allows you to reset the DAP.

Defining Individual Parameters

To define parameters individually, follow these steps:

1. Press the button beneath the desired parameter submenu.

<div> <div>L</div> <div>Configuration Mode</div> </div>				Escape	Top
DAP	Alias	RCP	P Rate >		
1	2	3	4	<	>

2. To display a parameter's current setting and possible options, press the button beneath it. (In submenus that contain more than four parameters, you may need to press the > button to scroll to the desired parameter.) The screen then displays the current setting on the top line and the possible options on the bottom line.

<div> <div>L</div> <div>DAP Config</div> </div>				Escape	Top
Locat	Ntwrk	RTS	DCD >		
1	2	3	4	<	>

3. To change the current setting, press the button beneath the desired setting. The top line of the screen then displays the revised setting.

<div> <div>L</div> <div>Location = Remote</div> </div>				Escape	Top
Centr	Remot				
1	2	3	4	<	>

<div> <div>L</div> <div>Location = Central</div> </div>			
Centr	Remot		

4. Press the **Escape** button. You can then define another parameter within the same submenu.

Several parameter screens display the words `Inc`, `Dec`, and `Acct` on the bottom line. For example:

L	T x L v l	U p p r	T h r s h =	1 5 d b
I n c	D e c	A c c p t		

This means that to change this parameter, you must increase or decrease its current value (rather than select from a list of possible options). When this type of screen is displayed, a cursor appears beneath the rightmost digit. To increase its value, press the button beneath `Inc`; to decrease the value, press the button beneath `Dec`. When you change the value of a digit, a `C` appears in the lower right corner of the screen. To move the cursor to the next digit, press the `<` button. When the desired value is displayed on the top line, press the button beneath `Acct` to enter it.

The remainder of this chapter discusses the parameters contained within each of the parameter submenus.

DAP Parameters

The DAP submenu contains the parameters which control basic DAP operation and allow you to configure the unit to the DTE's operating characteristics. Table 5-2 lists these parameters along with their possible settings. Parameters are listed in the order that they appear on the screen. The screen abbreviation for each parameter is shown in parenthesis.

Table 5-2. DAP Parameters

Parameter	Possible Settings
Location (Locat)	Central, Remote
Network ¹ (Ntwrk)	Multipoint, Point-to-Point
RTS ²	Constant, DTE
DCD	Constant, DCE
Transmit Clock (TxClk)	External, Slave, Internal ³
Port Receive Clock (PRxCk)	External, Internal
CTS Delay (CTSDl)	0, 10, 20, 40 ms
Squelch Primary TX (Sqlch)	Disabled, Enabled
DSR Off (DSROf)	Tests, All
DSR On (DSROn)	Constant, DDS Up, DAP On
EIA Pin 21 ⁴ (EIA21)	Signal Quality, Remote Digital Loop, Digital Loop Disabled
Beeper (Beepr)	None, Alarm, Keys, Both
EIA Pin 18 ⁵ = Local Digital Loopback (EIA18)	Enabled, Disabled
Remote Digital Loop (RemDl)	V.54 Loop 2, Racal DL
DTR Control (DTR)	Constant, DTE
CTS Control (CTS)	RTS On, DDS Up
RTS Simulation ⁶ (RTSSm)	Disabled, V.13, Out of Band
DCD Simulation ⁶ (DCDSm)	Disabled, V.13, Out of Band
Protocol (Proto)	Synchronous, Asynchronous
Interface (Intrf)	V.35, RS232
Range ⁷	Normal, Extended

Table 5-2. DAP Parameters (Continued)

Parameter	Possible Settings
Latching Loopback ⁸ (Latch)	Enabled, Disabled
Transmit Calibrate ⁹ (TxCal)	Accept
Pattern (Pttm)	2047, 511
Secondary Channel ¹⁰ (SecCh)	Clear Secondary Channel, Remote Control Panel
Network Delay ¹¹ (NetDI)	Short, Medium, Long, Extra Long
Automatic Poll ¹¹ (APoll)	Enabled, Disabled
Modify Drop Table ¹¹ (ModDT)	Add, Delete
One's Density ¹² (1Dens)	Enabled, Disabled

1. This parameter appears on the screen when the service is set for DDS, DDS-SC, or DDSNI. This parameter does not appear on the screen when the service is set for LADC, LDM, CC64, or C64NI. For these services, the unit defaults to point-to-point.
2. This parameter appears on the screen only when the RTS Simulation parameter is disabled.
3. This selection appears on the screen only when the service is set for LADC or LDM.
4. This parameter does not appear on the screen when the interface is V.35 or when the service is set for DDS or CC64. (The unit defaults to Signal Quality.)
5. This parameter does not appear on the screen when the interface is V.35.
6. This parameter appears on the screen only when the service is set for DDSNI, CC64, or C64NI.
7. For units equipped with the 15P09AA or Model D Aggregate card, extended range operation is automatic and this parameter does not appear on the screen. For units equipped with older Aggregate cards (Model A or C), the following conditions apply: (1) When the service is set for LADC or LDM, this parameter appears for all DTE rates. (2) When the service is set for DDS, DDSNI or DDS-SC, this parameter appears on the screen only when the DTE rate is 19.2 Kbps or greater. (3) This parameter does not appear on the screen when the service is set for CC64 or C64NI.

8. This parameter appears on the screen only when the service is set for DDS-SC or CC64.
9. This parameter appears on the screen only for units equipped with the Model A or C Aggregate card.
10. This parameter does not appear on the screen when the service is set for DDS or CC64.
11. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, and the Network parameter is set to multipoint.
12. This parameter appears on the screen only when the service is set for DDS-SC and the DTE rate is set to 56 Kbps.

The following sections explain the function of each DAP parameter.

Location

The Location parameter specifies whether your DAP is located at the central or remote site in the network. The proper setting is essential to the operation of the Multidrop and RCP features.

Network

The Network parameter specifies the network configuration for your unit. In a point-to-point network a single central site DAP exchanges data over the telephone line with a single remote site DAP. In a multipoint network a single central site DAP exchanges data over the telephone line with DAPs located at two or more remote sites.

RTS

This parameter specifies whether the RTS signal is controlled by the DTE or held in a constant On condition. When DTE is selected, the RTS signal is controlled by the DTE.

DCD

The DCD parameter specifies whether the DCD signal is always in a high condition or is controlled by the DAP. When Constant is selected, the DCD signal is always high except when in a test mode. When DCE is selected, the DCD signal is controlled by the DAP.

Transmit Clock

This parameter specifies the source of timing signals for the DAP's transmit clock. This clock determines the rate at which data is transmitted across the telephone lines. The options available for channel timing depend on the mode of operation.

- **Slave** - When operating over the DDS, DDS-SC, or CC64 network, the timing is fixed. Receive (Rx) channel timing is slaved to the DDS Rx line and transmit (Tx) channel timing is slaved to the Rx channel timing. Data is transmitted synchronized to a clock derived from the receive line. This option is also available in LDM mode.
- **Internal** - This option is available in the LADC and LDM modes. Data is transmitted synchronized to the DAP's internal crystal.
- **External** - When the DAP is operating over the DDS network and the External option is selected for timing, the external transmit clock must be synchronized with the network clock. Only phase differences are allowed when this option is selected. The clock signals must be frequency locked. When operating in LADC or LDM mode and the External option is selected for channel timing, the external transmit clock must have an accuracy of 0.01% of the selected data rate. In LADC or LDM mode, if an external transmit clock source is selected but is not present, the DAP automatically reverts to internal transmit clock mode.

Notes: For units equipped with the Switched 56 IDBU feature, when the service is set for LADC or LDM, do not set the clock to External unless the external clock is frequency locked to the Switched 56 network.

Port Receive Clock

This parameter specifies the source of timing for the port's receive clock. This clock determines the rate at which data is transmitted from the port into the attached device. One of two modes can be selected:

- **Internal Receive Clock Mode** - When this mode is selected, the Received Data signal presented at the DTE interface is synchronized to the clock extracted from the network. The DTE must use the receive clock provided by the DAP to sample the data signal. This is the recommended setting for most applications.
- **External Receive Clock Mode** - When this mode is selected, the Received Data signal presented by the DAP at the DTE interface is synchronized to the External Transmit Clock signal provided by the DTE. Since the data signal received from the network is always synchronous to the network clock, the External Transmit Clock signal provided by the DTE must be frequency locked to the network clock to prevent loss of data. If the External Receive Clock Mode is selected and the External Transmit Clock signal is not present at the DTE interface, the unit automatically switches to the Internal Receive Clock Mode.

CTS Delay

This parameter allows you to set additional RTS/CTS delay required in certain network applications. The delay times available are 0, 10, 20, and 40 ms. This is an additional delay added to the basic RTS/CTS delay. The basic delay is dependent on the DTE data rate and the method of transmitting the RTS signal to the far end (in-band or out-of-band). The minimum and maximum delay for a DAP using the out-of-band method is 0.75 to 15.0 ms.

Squelch Primary Transmitter

When this parameter is enabled, the DAP squelches (disables) its primary transmitter. Note that this setting disables the secondary channel when the service is set for DDSNI or C64NI and the Network parameter is set to multipoint. This parameter should normally be disabled.

DSR Off

This parameter specifies whether the DSR signal goes off while the unit is in any test mode including loops generated by the network (All) or only if the internal test pattern (e.g. Self-Test or End-to-End Error Test) of the unit is enabled (Tests).

DSR On

This parameter allows you to select the conditions upon which the DSR signal turns on. When Constant is selected, the DSR signal is on when power is applied to the DAP. When DAP On is selected, the DSR signal is on if the unit has power, but may turn off depending upon the option selected in the DSR Off parameter. When the circuit assurance option (DDS Up) is selected, the Excalibur Multirate DAP does not turn on DSR if the DDS is not functional and turns it off depending on the DSR Off setting.

Note: When set to Constant, the DSR Off parameter can be ignored since DSR is always active.

EIA Pin 21

This parameter specifies whether pin 21 of the DTE interface functions as a Remote Digital Loop input or a Signal Quality indicator. The Remote Digital Loop setting allows a DTE to initiate a remote digital loop by placing a High signal on pin 21. When set to Signal Quality, the DAP places a High signal on this pin when the quality of the received signal is acceptable (Good or Best on the front panel). If you want this pin to function as a Remote Digital Loop input but do not want this test to be initiated from a DTE, set this parameter to DL disabled. For proper operation, you must set jumper **JS5** on standalone models equipped with the 15P09AA-1 Aggregate card to match this parameter setting. For central site models equipped with the Model D Aggregate card, set switchbank **S3**, Switch **2** and for older standalone and central site models (Model A or C Aggregate card), set **SW5** to match this parameter setting. This parameter is not available for DDS or CC64.

Beeper

This parameter defines the operation of the front panel beeper. Four options are available:

- None - the beeper is disabled.
- Alarm - the beeper sounds whenever an alarm is activated.
- Keys - the beeper sounds whenever a button is pressed.
- Both - the beeper sounds whenever a button is pressed or an alarm is activated.

EIA Pin 18

This parameter enables/disables DTE control over the Local Digital Loopback Test. When enabled, a DTE can initiate a Local Digital Loopback Test by placing a high signal on pin 18 of the DTE interface.

Remote Digital Loop

This parameter specifies whether the DAP performs a V.54 Digital Loop or a standard (Racal) Digital Loop when it receives a remote digital loop command from the far-end unit. This parameter is only applicable for Aggregate level tests. Refer to Chapter 7 for descriptions of test levels and both types of loops.

DTR Control

This parameter specifies whether the DTR signal is controlled by the DTE or held in a constant On condition. DTR is the "master enable" for all DTE control signals (RTS, CTS, etc.). When Constant is selected, the DAP ignores the DTR signal from the DTE and holds it constant. When DTE is selected, the DTR signal is controlled by the DTE.

CTS Control

This parameter allows you to set the unit's CTS signal. When RTS On is selected, the CTS signal is generated only if the RTS signal is active and the unit can accept data for transmission. When the circuit assurance option (DDS Up) is selected, the DAP does not provide CTS in response to RTS if any of the following fault conditions occur:

- The DAP is not detecting a valid network or multiport framing pattern in the received data.
- The DAP is receiving an Out-of-Service code from the DDS network indicating a failure within the network.
- The DAP is receiving an Abnormal Station code indicating a problem with a remote station.
- The DAP is detecting an invalid receive signal.

RTS Simulation

This parameter specifies the RTS Simulation method in the DDSNI, CC64, and C64NI modes. In the other modes of operation, RTS controls DCD without the need for simulation. See the following description under "DCD Simulation."

DCD Simulation

This parameter specifies the DCD Simulation method in the DDSNI, CC64, and C64NI modes. In the other modes of operation, RTS controls DCD without the need for simulation. The RTS and DCD Simulation parameters are used in applications where the DTE needs to see a DCD change of state. These parameters are used in conjunction with one another; i.e., if RTS Simulation is enabled at one end of the circuit, DCD Simulation must be enabled at the other end of the circuit. Three options are available:

- **Disabled** - RTS-DCD Simulation is disabled.

- **V.13** - is only supported when the port is configured for synchronous operation. If RTS Simulation is enabled at the far-end port and DCD Simulation is enabled at the local port, when the far-end port raises RTS, the port transmits a 24-bit Up code to the local port. There is an RTS-CTS delay to allow the far-end port enough time to transmit the Up code before accepting data from the DTE. The RTS-CTS delay is dependent on the port speed as listed in Table 5-3. When the local port detects the Up code, the port raises DCD and is ready to receive the data transmitted from the far-end DTE. After the far-end DTE has transmitted its data and drops RTS to the port, the far-end port transmits a 128-bit Down code to the local port. After the local port detects the first 48 bits of the 128-bit Down code, it drops DCD. This means the DTE will receive the first 48 bits of the Drop code. RTS-DCD Simulation may be configured to work in either or both directions (inbound to or outbound from the central site).
- **Out of Band** - can be used when the port is configured for synchronous or asynchronous operation. Signaling is carried on the portion of the aggregate bandwidth allocated for unit to unit non-interruptive secondary communications. This method does not add bits to the user data stream and allows the use of RTS-DCD Simulation with equipment that is sensitive to in-band signaling. Table 5-4 lists the RTS-DCD worst case delay related to out of band RTS-DCD Simulation.

Notes: When the DAP's aggregate rate is 19.2 Kbps or lower, out of band signaling requires that you leave 1.2 Kbps of the available bandwidth unassigned to the port.

Out of band RTS-DCD Simulation is not provided during dial backup operation for units equipped with the Analog or ISDN IDBU feature.

Table 5-3. RTS-CTS Delay Related to V.13 RTS-DCD Simulation

Port Speed	Line Rate 64 Kbps
75 bps	320 ms
150 bps	160 ms
300 bps	80 ms
600 bps	40 ms
1200 bps	20 ms
2400 bps	10 ms
4800 bps	5 ms
7200 bps	3.3 ms
9600 bps	2.5 ms
12.0 Kbps	2 ms
14.4 Kbps	1.7 ms
16.8 Kbps	1.4 ms
19.2 Kbps	1.3 ms
38.4 Kbps	625 μ s
57.6 Kbps	417 μ s

Notes: This table is only intended as an example. It does not provide the RTS-CTS delay for all available port speeds.

The RTS-CTS delay added by RTS-DCD Simulation is in addition to the RTS-CTS delay selected by the Port CTS Delay parameter described on page 5-13. It is possible to see the DCD drop code at the DTE interface per CCITT Recommendation V.13

V.13 RTS-DCD Simulation is not supported when the port is configured for asynchronous operation.

Table 5-4. Worst Case RTS-CTS Delay Related to Out of Band RTS-DCD Simulation

DDS Channel Rate	Worst Case RTS-CTS Delay
64 Kbps	10 ms
56 Kbps	17 ms
19.2 Kbps	10 ms
9.6 Kbps	10 ms

Notes: The RTS-CTS delay added by RTS-DCD Simulation is in addition to the RTS-CTS delay selected by the Port CTS Delay parameter described on page 5-13.

Out of band RTS-DCD Simulation can be used when the port is configured for synchronous or asynchronous operation.

Protocol

The Protocol parameter specifies whether the port operates in synchronous or asynchronous mode. The correct setting depends on the type of DTE connected to the port. When asynchronous mode is selected, the submenu parameters are:

- Asynchronous Data Bits (AsDaB) - This parameter specifies the asynchronous character length used. The character length, which includes one start bit and one stop bit, can range from 8 to 11. The correct setting depends on the DTE connected to the DAP.
- Asynchronous Mode (AsMod) - This parameter specifies the asynchronous mode of operation. When Normal mode is selected, the Excalibur Multirate DAP can compensate for a DSU/DTE rate differential of +1%, -2.5%. In Extended mode, the maximum rate differential allowed is +2.3%, -2.5%. Normal mode, which provides lower distortion, is recommended for most applications.

Interface

This parameter specifies whether the RS-232-E or V.35 interface is used. When the V.35 interface is used, the corresponding adapter must be connected to the **DTE** connector located on the rear panel. For models equipped with the 15P09AA or Model D Aggregate card, the 12-position shunt jumper must be installed on the p.c. board in location **X5** for RS-232-E or **X4** for V.35.

Range

This parameter does not appear on the screen for units equipped with the 15P09AA or Model D Aggregate card. Extended range operation is automatic and allows operation in loops from 0 to -51dB. For units equipped with older Aggregate cards (Model A or C), the Range parameter specifies whether the DAP can operate in the extended range.

When operating in the normal range, the DAP receiver accommodates a nominal loop loss of 0 to -34 dB which complies with the requirements of AT&T Publication 62310. In DDS, DDSNI, and DDS-SC modes, the extended range feature allows operation in loops from -35 to -40 dB for DTE rates from 19.2 to 38.4 Kbps and in loops from -35 to -43 dB for the 56 Kbps DTE rate. In LADC and LDM modes, the extended range feature allows operation in loops from -35 to -40 dB for DTE rates from 2.4 to 38.4 Kbps and in loops from -35 to -43 dB for the 56 and 64 Kbps DTE rates. The performance in the extended range is dependent on the telephone company equipment.

Latching Loopback

This parameter enables/disables the latching loopback test in DDS-SC or CC64 mode. This is an optional network loopback test which is initiated by the reception of a complex sequence of code bytes as defined by AT&T Publication 62310.

Transmit Calibrate

This parameter appears on the screen only for units equipped with the Model A or C Aggregate Card. It allows you to calibrate the transmitter. Before calibrating the transmitter, you must disconnect the cable from the dedicated line connector, labeled **DED**. Press the button beneath **Accept**. When calibration is complete, reinstall the dedicated line cable. This procedure must be performed whenever the power supply is changed.

Pattern

This parameter defines the test pattern. Two patterns are available: 2047 and 511. The pattern you select is the one that will be used any time a Self-Error, End-to-End Error, Loop 2 Error, Local-Error, or Network-Error test is activated.

Secondary Channel

This parameter specifies whether the Clear Secondary Channel feature or the Remote Control Panel feature is enabled. The Clear Secondary Channel feature is not available for DDS and CC64 modes. When Clear Secondary Channel is selected, you can use the secondary channel bandwidth for your own application. All T7 diagnostic and Remote Control Panel functions are disabled.

You can use this channel only with asynchronous data protocols. The character format is one start bit, eight data bits, and two stop bits. The available DTE rates depend on the service and the DDS line rate as listed in Table 5-5.

Table 5-5. Clear Secondary Channel Rates

DDS Line	DDS-SC, LADC ¹ , LDM	DDSNi, C64Ni
2.4 Kbps	75 bps	75 bps
4.8 Kbps	75, 150 bps	75 bps
9.6 Kbps	75, 150, 300 bps	75, 150 bps
19.2 Kbps	75, 150, 300, 600 ² bps	75, 150, 300 bps
56 Kbps	75, 150, 300, 600 ² , 1200 ² bps	75, 150, 300 bps
64 Kbps	Not Applicable	75, 150, 300 bps

1. Only available for units equipped with the Model A or C Aggregate card.
2. The 600 and 1200 bps rates are not available for units equipped with the Switched 56 or ISDN IDBU feature.

Network Delay

This parameter allows you to select the round trip delay time plus the remote unit response time for data to be sent from the central unit to the far-end remote unit and back to the central unit. This parameter is available only when the service is set for DDSNi, the Location parameter is set to central, and the Network parameter is set to multipoint. Four options are available:

- **Short** - 568 milliseconds for line rates of 2.4 and 4.8 Kbps, 380 milliseconds for a line rate of 9.6 Kbps (multiport framing disabled), and 132 milliseconds for line rates of 9.6 (multiport framing enabled), 19.2, and 56 Kbps.
- **Med** - 616 milliseconds for line rates of 2.4 and 4.8 Kbps, 432 milliseconds for a line rate of 9.6 Kbps (multiport framing disabled), and 180 milliseconds for line rates of 9.6 (multiport framing enabled), 19.2, and 56 Kbps.
- **Long** - 688 milliseconds for line rates of 2.4 and 4.8 Kbps, 500 milliseconds for a line rate of 9.6 Kbps (multiport framing disabled), and 252 milliseconds for line rates of 9.6 (multiport framing enabled), 19.2, and 56 Kbps.

- **ELong** - 1.076 seconds for line rates of 2.4 and 4.8 Kbps, 888 milliseconds for a line rate of 9.6 Kbps (multiport framing disabled), and 640 milliseconds for line rates of 9.6 (multiport framing enabled), 19.2, and 56 Kbps.

Notes: When this parameter is set to **ELong**, it is recommended that you set the **Automatic Poll** parameter to disabled.

This parameter is used by the DAP only for internal processing of the alignment table. It is not used for customer data.

If you know the network propagation delay, you can optimize this selection to the one best suited for your network. Add the network propagation delay to the worst case remote unit response time for the selected line rate as listed in Table 5-6. Select the setting that is closest to but greater than the network propagation delay plus the worst case remote unit response time value. For example, the correct setting for a unit running at 4.8 Kbps with 34 μ s propagation delay is: 432 ms (worst case remote unit response time) + 34 μ s (propagation delay) = 432.034 ms = **Short**.

Table 5-6. Remote Unit Response Time

Aggregate Rate	Worst Case Remote Unit Response Time
2.4, 4.8 Kbps	432 ms
9.6 Kbps (multiport framing disabled).	222 ms
9.6 (multiport framing enabled), 19.2, 56 Kbps	117 ms
56 Kbps	134.5 ms

If any remote units are out-of-state, the recommended setting is **Long**. Otherwise, the default setting, **Med**, should be suitable for most applications.

Automatic Poll

This parameter specifies whether the central unit automatically detects the presence of any remote drops that have been added to or removed from the circuit. This parameter is available only when the service is set for DDSNI, the Location parameter is set to central, and the Network parameter is set to multipoint. The polling table can also be updated manually using the Modify Drop Table feature described in the following section or it can be updated by activating the Auto-Learn Network feature. (See Chapter 4, "Auto-Learn Network" for instructions.) The disabled setting is recommended for networks with infrequent topology changes.

Modify Drop Table

The Modify Drop Table feature allows you to add or remove a remote drop from the existing poll table of a central unit. This parameter is available only when the service is set for DDSNI, the Location parameter is set to central, and the Network parameter is set to multipoint. Any changes to the poll table cause data to be interrupted momentarily while the central unit resynchronizes the circuit using the unit addresses in the new poll table.

One's Density

This parameter allows you to ensure that the string of zeros in Milgo aggregate diagnostic test patterns can not cause more than seven zeros in a row on the DDS link (an error condition). This parameter is available only when the service is set for DDS-SC and the DTE rate is set to 56 Kbps. When this parameter is enabled, the DAP forces the secondary CMS network management T7 channel bit to 1 any time main channel data contains seven 0 bits. The secondary channel may operate a little slower when this parameter is enabled.

This feature does not ensure error-free multipoint DDS-SC operation at 56 Kbps (when one's density coding restrictions apply) as it can not force the secondary channel bit to 1 when an all 0s data byte is being transmitted by another drop. If you can not guarantee the required one's density (Bell Core TR-NLP 00157) in 56 Kbps multidrop operation, the network must be provisioned with Clear Channel 64 Kbps capability.

Channel Parameters

The Channel submenu contains the parameters that allow single port units to be configured for use with DDS networks using Milgo's multiport/multidrop frame specification. This feature is available only when the service is set for DDSNI and the Multiport Framing parameter is enabled. When this feature is selected, the unit operates with the same DDS line rates (9.6, 19.2, and 56 Kbps) and supports the same DTE data rates as the Excalibur Multiport DAP.

Selecting the DTE Data Rate

To select the DTE data rate for each channel, follow these steps, starting from the Configuration Mode submenu.

1. Press the **4** button to enter the Configure Channels submenu.

L Configuration Mode				Escape	Top
R C P	D i a l	T h r s h	C h n n l >		
1	2	3	4	<	>

2. Press the **1** button.

L Configure Channels				Escape	Top
S p e e d	A s s g n	N a m e			
1	2	3	4	<	>

3. Press the **1** button. The screen then displays a list of channel numbers on the bottom line. The **All** option allows you to simultaneously set all channel data rates to the same rate.

L Channel Speeds				Escape	Top
D e f i n	D s p l y				
1	2	3	4	<	>

L Define Channel Speeds				
All	C 1	C 2	C 3	>

4. Press the button beneath the channel you wish to set. (To set Channels 4 - 6, you must first press the > button.) The screen now displays the channel's current DTE data rate and possible options.

L Define Channel Speeds					Escape	Top
All	C 1	C 2	C 3	>		
1	2	3	4		<	>

L C 1 = 2 4 0 0				
5 2 8 0 0	5 1 6 0 0	5 0 4 0 0	4 9 2 0 0	>

For DAPs with Part No. 15-09Bxx2x0xxx, the possible DTE data rate options are.

- Synchronous DTEs - 1.2 to 52.8 Kbps in multiples of 1200 bps (except 3.6 and 6 Kbps are not provided) and none.
- Asynchronous DTEs - 75, 150, 300, 600 bps and 1.2, 2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2, 24, 28.8, 48 Kbps, and none.

Notes: Data rates below 1.2 Kbps take up 1.2 Kbps of aggregate data channel bandwidth.

For proper operation, central and all remote units must have the same channel rate assignments.

For older DAPs, the possible DTE data rate options are:

- Synchronous DTEs - 1.2, 2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2, 28.8, 38.4, 52.8 Kbps, and none.
- Asynchronous DTEs - 75, 150, 300, 600 bps: 1.2, 2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2 Kbps, and none.

Notes: The 28.8 Kbps port rate is only supported for Excalibur Multiport DAPs equipped with the Model B Multiport card. For Excalibur Multirate DAPs, channels may be assigned the 28.8 Kbps port rate for compatibility with multiport units, but an error message appears on the screen if you try to assign the port to a channel set at this rate.

- Press the button beneath the desired setting. The top line of the screen displays the revised setting. Press the **Escape** button to return to the channel number list display.

<div> <div>L</div> <div>C 1 = 2 4 0 0</div> </div>				Escape	Top
5 2 8 0 0	5 1 6 0 0	5 0 4 0 0	4 9 2 0 0 >		
1	2	3	4	<	>

<div> <div>L</div> <div>C 1 = 4 9 2 0 0</div> </div>			
5 2 8 0 0	5 1 6 0 0	5 0 4 0 0	4 9 2 0 0 >

- Repeat Steps 4 and 5 until all the channel speeds are set. Then press the **Escape** button to return to the Channel Speed submenu. You must press the button beneath **Accpt** to enter the DTE data rates into memory. If you try to enter an invalid configuration, caused by exceeding the aggregate channel bandwidth, an error message will appear on the screen. If you do not press the button beneath **Accpt** before pressing the **Escape** button, a prompt will appear on the screen asking if you want to accept the changes.

<div> <div>L</div> <div>Channel Speeds</div> </div>				Escape	Top
Defin	Dsply	Accpt			
1	2	3	4	<	>

- If you wish to display the current data rate setting for each channel, press the button beneath **Dsply**. The screen then displays channel 1's current data rate. Press the button beneath each channel number for which you want to display the current data rate.

<div> <div>L</div> <div>Channel Speeds</div> </div>				Escape	Top
Defin	Dsply	Accpt			
1	2	3	4	<	>

<div> <div>L</div> <div>C 1 = 4 9 2 0 0</div> </div>			
C 1	C 2	C 3	C 4 >

Press the **Escape** button twice to return to the Configure Channels submenu.

Channel Assignment

To assign the Excalibur Multirate DAP's port to one channel in the aggregate data stream, follow these steps, starting from the Configure Channels submenu.

- 1. Press the **2** button.

[L] Configure Channels				Escape	Top
Speed	Assgn	Name			
1	2	3	4	<	>

- 2. Press the **1** button.

[L] Port Assignments				Escape	Top
Defin	Dsply				
1	2	3	4	<	>

- 3. The top line of the screen displays the port's current channel assignment. If you want to assign the port to a different channel, press the button beneath the desired channel number. The top line of the screen then displays the new channel assignment.

[L] Port Assigned to C 1				Escape	Top
None	C 1	C 2	C 3	>	
1	2	3	4	<	>

[L] Port Assigned to C 2				
None	C 1	C 2	C 3	>

- Press the **Escape** button to return to the Port Assignments submenu. You must press the button beneath **Accept** to enter the port's channel assignment into memory. If you do not press the button beneath **Accept** before pressing the **Escape** button, a prompt will appear on the screen asking if you want to accept the changes. The screen then returns to the Configure Channels submenu.

<div> <div>L</div> Port Assignments </div>				Escape	Top
Defin	Dsply	Accpt			
1	2	3	4	<	>

- If you wish to display the port's current channel assignment, enter the Port Assignments submenu and press the 2 button. The screen displays the port's current channel assignment.

<div> <div>L</div> Port Assignments </div>				Escape	Top
Defin	Dsply				
1	2	3	4	<	>

<div> <div>L</div> Port Assigned to </div>	
C 2	

Naming Channels

The Name parameter allows you to assign an alphanumeric name to each channel. Each name can be up to five characters long and is used by all menus.

To assign a name to a channel, follow these steps, starting from the Configure Channels submenu.

- Press the **3** button.

<div> <div>L</div> Configure Channels </div>				Escape	Top
Speed	Assgn	Name			
1	2	3	4	<	>

- Press the button beneath the channel you want to name. The screen displays the current name on the top line, with a cursor located beneath the leftmost space.

<div> <div>L</div> <div>Define Channel Names</div> </div>					Escape	Top
C 1	C 2	C 3	C 4	>		
1	2	3	4		<	>

- Press the 1 or 2 button to scroll through the different letters, numbers, and symbols that can be entered in the space.

<div> <div>L</div> <div>Channel 1 = C 1</div> </div>					Escape	Top
Inc	Dec	Accpt	Other			
1	2	3	4		<	>

- When the desired character is displayed, press the > button to move the cursor to the next space.

<div> <div>L</div> <div>Channel 1 = A 1</div> </div>					Escape	Top
Inc	Dec	Accpt	Other			
1	2	3	4		<	>

If you wish to insert a character between two entered characters or delete an entered character, follow Step 5. If you wish to copy an entered character, enter an M (without having to scroll to it), or enter a blank space, follow Step 6. If you do not wish to use any of these options, skip to Step 7.

5. Press the **4** button. You can now insert a character by pressing the **1** button, delete a character by pressing the **2** button, or delete a character and move the cursor one space to the left by pressing the **3** button. When finished, press the **4** button twice.

Channel 1 = A1				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

Channel 1 = A1			
INS	DEL	BCSP	Other

6. Press the **4** button twice. You can now copy a character into the next space by pressing the **1** button, enter an M in a space by pressing the **2** button, or enter a blank space by pressing the **3** button. When finished, press the **4** button.

Channel 1 = A1				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

Channel 1 = A1			
Cpy >	M	Blank	Other

7. Continue in this manner until you have entered the desired name. Then press the **3** button to enter it into memory. The display returns to the Define Channel Names submenu. The bottom line of the screen displays the new channel name.

Channel 1 = ATM				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

Define Channel Names			
ATM	C2	C3	C4 >

Port Rate Configuration

This submenu allows you to set the DTE interface to operate at a lower data rate than the DDS line rate. This feature, called Rate Adaption, is available for the C64NI mode and the DDSNI mode when the Multiport Framing parameter is disabled. The available DTE data rates are dependent on the DDS line rate as listed in Tables 5-7 and 5-8 for DAPs with Part No. 15-09Bxx2x0xxx. For older DAPs, the available DTE rates are listed in Tables 5-9 and 5-10.

Table 5-7. Synchronous Rate Adaption

DDS Line	DTE Data Rates
2.4 Kbps	2.1, 1.2 Kbps
4.8 Kbps	4.5, 2.4, 1.2 Kbps
9.6 Kbps	9.0, 8.4, 7.2, 4.8, 2.4, 1.2 Kbps
19.2 Kbps	18.0, 16.8, 15.6, 14.4, 13.2, 12.0, 10.8, 9.6, 8.4, 7.2, 4.8, 2.4, 1.2 Kbps
56 Kbps	52.8, 51.6, 50.4, 49.2, 48.0, 46.8, 45.6, 44.4, 43.2, 42.0, 40.8, 39.6, 38.4, 37.2, 36.0, 34.8, 33.6, 32.4, 31.2, 30.0, 28.8, 27.6, 26.4, 25.2, 24.0, 22.8, 21.6, 20.4, 19.2, 18.0, 16.8, 15.6, 14.4, 13.2, 12.0, 10.8, 9.6, 8.4, 7.2, 4.8, 2.4, 1.2 Kbps
64 Kbps	57.6, 56.0, 52.8, 51.6, 50.4, 49.2, 48.0, 46.8, 45.6, 44.4, 43.2, 42.0, 40.8, 39.6, 38.4, 37.2, 36.0, 34.8, 33.6, 32.4, 31.2, 30.0, 28.8, 27.6, 26.4, 25.2, 24.0, 22.8, 21.6, 20.4, 19.2, 18.0, 16.8, 15.6, 14.4, 13.2, 12.0, 10.8, 9.6, 8.4, 7.2, 4.8, 2.4, 1.2 Kbps

Table 5-8. Asynchronous Rate Adaption

DDS Line	DTE Data Rates
2.4 Kbps	1.2, 0.6, 0.3, 0.15, 0.075 Kbps
4.8 Kbps	2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
9.6 Kbps	7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
19.2 Kbps	16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
56 Kbps	48.0, 28.8, 24.0, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
64 Kbps	57.6, 48.0, 28.8, 24.0, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps

Table 5-9. Synchronous Rate Adaption (Older DAPs)

DDS Line	DTE Data Rates
2.4 Kbps	2.1, 1.2 Kbps
4.8 Kbps	4.5, 2.4, 1.2 Kbps
9.6 Kbps	9.0, 7.2, 4.8, 2.4, 1.2 Kbps
19.2 Kbps	18.0, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2 Kbps
56 Kbps	52.8, 38.4, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2 Kbps
64 Kbps	57.6, 38.4, 19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2 Kbps

Table 5-10. Asynchronous Rate Adaption (Older DAPs)

DDS Line	Data Rates
2.4 Kbps	1.2, 0.6, 0.3, 0.15, 0.075 Kbps
4.8 Kbps	2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
9.6 Kbps	7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
19.2 Kbps	16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
56 Kbps	19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps
64 Kbps	19.2, 16.8, 14.4, 12.0, 9.6, 7.2, 4.8, 2.4, 1.2, 0.6, 0.3, 0.15, 0.075 Kbps

RCP Parameters

The RCP submenu contains the parameters which control the operation of the RCP feature. Table 5-11 lists these parameters along with their possible settings. Parameters are listed in the order that they appear on the screen. The screen abbreviation for each parameter is shown in parenthesis.

Table 5-11. RCP Parameters

Parameter	Possible Settings
Controller ¹ (Cntrl)	No, Yes
RTS Mode (RTSMd)	Constant, Switched
DCD Mode (DCDMd)	Constant, Switched
Secondary Channel Format ² (SCFmt)	Excalibur, 1500, 1556, DSU-RD
Local Diagnostics ^{3,4} (LDiag)	Enabled, Disabled
Remote Diagnostics ³ (RDiag)	Enabled, Disabled
Alarm Detection (AlmDt)	Disabled, Enabled
Local Alarm Display (LAlmD)	Disabled, Enabled
Analog Regeneration (AnaRg)	Enabled, Disabled
Digital Regeneration (DigRg)	Enabled, Disabled
Diagnostic Compatibility (DiagC)	On, Off
Route Secondary Channel ⁵ (RoutS)	To Dial, With Data

1. This parameter does not appear on the screen when the Clear Secondary Channel parameter is enabled.
2. This parameter appears on the screen only when the service is set for DDS, DDS-SC, or LDM. It does not appear for DDS-SC or LDM when the Clear Secondary Channel parameter is enabled. The unit defaults to Excalibur.
3. This parameter appears on the screen only when the service is set for DDS.
4. This parameter does not appear on the screen if the unit is set for a remote unit in a multipoint network.
5. This parameter appears on the screen only for units equipped with the Analog or ISDN IDBU option.

The following sections describe each of the RCP parameters.

Controller

This parameter specifies whether your DAP is configured for external control (CMS) or RCP control. If you want external control, select No. If you want RCP control, select Yes. If Yes is selected, diagnostic control may be initiated from CMS or the front panel but not simultaneously.

RTS Mode

The RTS Mode parameter specifies whether the unit monitors for constant RTS or an RTS change of state at the DTE interface. The RTS signal is monitored to detect certain network problems, such as streaming or idle channel. If Constant is selected, the unit monitors for constant RTS at the DTE interface. Failure to detect constant RTS for the period of time set in the RTS Threshold Timer results in a Transmit Channel Idle (TCI) alarm. If Switched is selected, the unit monitors RTS for a change of state at the DTE interface. If RTS is on for more than the specified period of time, the unit generates a Transmit Channel Streaming (TCS) alarm. It can also generate an Antistreaming Started alarm when the Antistreaming function is enabled.

Note: For the RTS Simulation and RTS Antistreaming features to operate properly, this parameter must be set to Switched.

DCD Mode

The DCD Mode parameter specifies whether the unit monitors for constant DCD or a DCD change of state at the DTE interface. The DCD signal is monitored to detect certain network problems, such as streaming or idle channel. If Constant is selected, the unit monitors for constant DCD at the DTE interface. Failure to detect constant DCD for the period of time set in the DCD Threshold Timer results in a Receive Channel Idle (RCI) alarm. If Switched is selected, the unit monitors DCD for a change of state at the DTE interface. If DCD is on for more than the specified period of time, the unit generates a Receive Channel Streaming (RCS) alarm.

Note: For the DCD Simulation and DCD Antistreaming features to operate properly, this parameter must be set to Switched.

Secondary Channel Format

This parameter allows you to select the secondary channel format. Excalibur is an improved version of Milgo's secondary channel format. However, this format is incompatible with Milgo's CMS DSU, CMS DSU RD, and CMS 6424 products. The secondary channel formats available for each service are listed in Table 5-12.

Table 5-12. Secondary Channel Format

Service	Excal	CMS DSU 1500	CMS DSU 1556	CMS DSU 500, 556 RD, CMS 6424
DDS	X	—	—	X
DDSNi	X	—	—	—
DDS-SC	X	X	X	—
LADC*	X	—	—	—
LDM	X	—	X	—
CC64	—	—	—	—
C64Ni	—	—	—	—

Legend: X = Valid Secondary Channel Format.
 * = Only available for units equipped with the
 Model A or C Aggregate card.

Local Diagnostics

This parameter appears on the screen only when the service is set for DDS. It enables/disables the unit to initiate diagnostics.

Remote Diagnostics

This parameter appears on the screen only when the service is set for DDS. It enables/disables the unit to respond to a diagnostic request.

Alarm Detection

This parameter specifies whether the DAP can display and report alarm conditions to the CMS network management system. The recommended setting for most applications is Enabled. If disabled, local alarms will not be displayed. The local alarms are stored in the alarm buffer. If the unit is configured for RCP control, incoming alarms will be displayed.

Local Alarm Display

This parameter specifies whether the front panel displays alarms that occur at the local DAP. (Incoming alarms are always displayed when the unit is configured for RCP control.) When disabled, local alarms are not displayed on the front panel, but may be reported to the CMS network management system.

Analog Regeneration

This parameter specifies whether the DAP's analog receiver regenerates secondary channel signals through the digital transmitter. The normal setting for most networks is Enabled.

Digital Regeneration

This parameter specifies whether the DAP's digital receiver regenerates secondary channel signals through the analog transmitter. The normal setting for most networks is Enabled.

Diagnostic Compatibility

This parameter specifies whether enhanced diagnostics are available. Since older DAPs do not perform the new diagnostics, the Diagnostic Compatibility parameter simplifies diagnostic testing by deleting the new diagnostics from the front panel menus. If you are performing tests with Multiport or Multirate DAPs equipped with Software Revision No. SSC0778 or lower, select On. To determine the software revision number of the unit, enter the Status submenu, press the button beneath `Unit`, then press the button beneath `Revsn`.

Route Secondary Channel

This parameter appears on the screen only for units equipped with the Analog or ISDN IDBU feature. It specifies whether the secondary channel transmits data across the dial-up telephone line, while the primary channel transmits data over the digital lines. When the To Dial option is selected, you can establish a dial backup connection with a remote Excalibur DAP and perform diagnostics and/or monitoring operations without affecting primary channel data on the dedicated line. This option provides a remote DAP operating in DDS or CC64 mode with a non-interruptive secondary channel and provides a CMS network management system with T7 secondary channel connection to a remote DAP.

In the example shown in Figure 5-1, from the CMS system console, a request is made for a dial backup connection with a central DAP. The central DAP is then configured to run at V32bis+ (for units equipped with the Analog IDBU feature) and to route T7 to the dial-up telephone line. When making the call from the CMS system console, the operator specifically requests that main channel data NOT be switched to the dial-up telephone line.

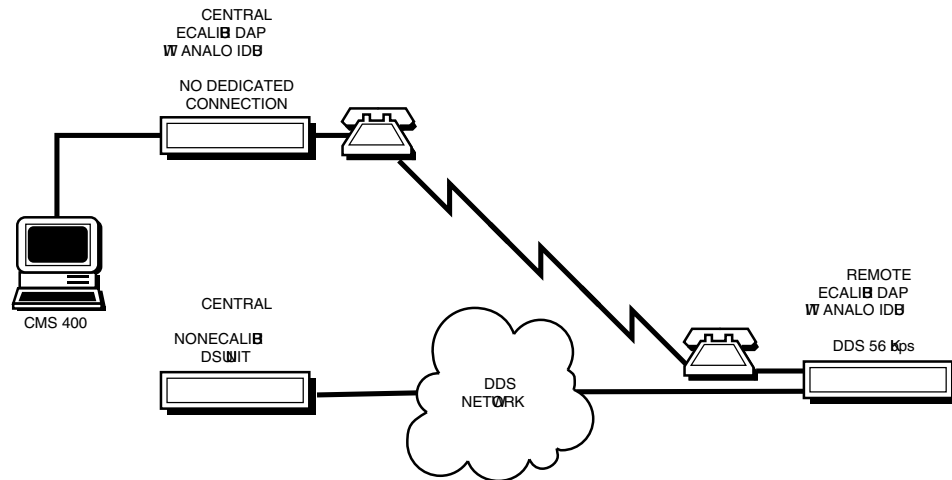


Figure 5-1. Secondary Channel Data Routed to Dial-Up Line

If the originating DAP has the Route Secondary Channel parameter set to ToDia and the answering DAP has it set to W/Dat, the answering unit will honor the setting of the originating unit if it is equipped with software revision number SSC0820 or higher. If the answering unit is equipped with a lower software revision number, the ToDia setting is invalid. The dial backup connection will be established, but secondary channel data will be routed with primary channel data.

To enable this feature from the DAP's front panel, follow these steps:

1. From the Configuration Mode menu, enter the RCP submenu, press the button beneath RoutS, then press the button beneath ToDia.
2. From the Configuration Mode menu, enter the Dial submenu, then press the button beneath DMode. For units equipped with Analog IDBU, press the button beneath button BIS+. For units equipped with ISDN IDBU, press the button beneath EISDN.

Note: For units equipped with ISDN IDBU, this feature cannot be enabled when the DAP is operating in CC64 mode.

To activate this feature from the DAP's front panel, follow these steps:

1. Enter front panel commands to originate a dial backup connection with the answering DAP. See Chapter 6, "Entering Telephone Numbers" and "Originating Dial Backup Calls" for instructions.
2. When the dial backup connection has been established, switch back to the dedicated lines by pressing the button beneath **Line** in the Call submenu. Then press the button beneath **Ded.** The DAP retains the dial backup connection and returns primary channel data to the digital lines.

Analog Dial Parameters

The Dial submenu contains the parameters which control the operation of the Analog IDBU feature. Table 5-13 lists these parameters along with their possible settings. Parameters are listed in the order they appear on the screen. The screen abbreviation for each parameter is shown in parenthesis.

Table 5-13. Analog Dial Parameters

Parameter	Possible Settings
Dial Mode (DMode)	32BIS, BIS+
Speed	14,400, 12,000, 9600 ¹ , 9000 ¹ 4800, 4500, 2400, 2100
Transmit Clock (TxClk)	Internal, External, Slave
Dialer (Dialr)	Autosense, Pulse, Tone
Wait to Dial (DWait)	2, 10, 20 seconds, Tone
Call Progress (Prgrs)	Enabled, Disabled
Automatic Dial (ADial)	DDS Down, No Signal, Network Down, DTR, None
Automatic Dial Timer (ADTim)	5, 15, 30, 60 seconds
Switch to Dial (SDial)	Always, DTR On

Table 5-13. Analog Dial Parameters (Continued)

Parameter	Possible Settings
Automatic Disconnect (Disc)	No DTR, None
Retry Attempts (Retry)	0 to 9
Dedicated Line Test (LTest)	None, DDS Up
Line Test Interval (LTInv)	5, 10, 15, 30 minutes
DCD Threshold (DCDTh)	Normal, Extended
Answer Calls (Answr)	Always, Never, DDS Line or Local Loop Down, No Signal
Answerback (AnsBk)	Enabled, Disabled
Transmit Equalizer (TxEqI)	Flat, Stat
Program Resistor (PgRes)	Ok
Compliance ² (Cmply)	Programmable, Permissive
Port RTS-DCD Simulation (Port)	Disabled, V.13

1. When 9600 or 9000 is selected, you may also select Coded or Uncoded.
2. The Compliance parameter selects the mode of dial operation (Programmable or Permissive). The default setting is Permissive. To change this setting, you must enter a special password that must be obtained from your Milgo service representative. The service representative will ensure that you are adhering to local compliance regulations before giving you the password.

The following sections explain the function of each Dial parameter.

Dial Mode

This parameter allows you to select the dial format. Two options are available: 32BIS and BIS+. BIS+ is an enhanced Milgo mode which supports a secondary channel. However, this format is incompatible with CCITT V.32bis modems.

Speed

This parameter specifies the speed the DAP automatically switches to when it originates a dial backup connection. The answering unit adapts to the originating unit's speed if the answering unit is set for a higher speed than the originating unit. If the answering unit is set for a lower speed, the connection will be made at the answering unit's speed except when it is set for 2.1, 2.4, 4.5, or 9.0 Kbps. Although the lowest data rate at which the modem in the IDBU can operate is 4.8 Kbps, the unit is able to support a synchronous DTE operating at 2.1, 2.4, or 4.5 Kbps. When the dial backup connection is made, the IDBU automatically sets up the call at 4.8 Kbps and performs rate adaption so the DTE port continues to operate at its current speed. When the DTE is operating at 9.0 Kbps, the IDBU automatically sets up the call at 9.6 Kbps and performs rate adaption so the DTE port continues to operate at 9.0 Kbps. Rate adaption and CCITT V.14 compliant asynchronous/synchronous conversion are provided only when the dial backup connection is between two Excalibur DAPs.

Transmit Clock

This parameter specifies the source of timing signals for the dial backup port's transmit clock. This clock determines the rate at which data is transmitted across the dial-up telephone line. The available options are:

- **Internal** - data is transmitted synchronized to the DAP's internal crystal.
- **External** - the transmit clock derives timing from an external clock source. If an external transmit clock source is selected but is not present, the port automatically reverts to internal transmit clock mode. This option is not available when the speed is set for 2.1, 4.5, or 9.0 Kbps.
- **Slave** - receive (Rx) channel timing is slaved to the dial-up Rx line and transmit (Tx) channel timing is slaved to the Rx channel timing. Data is transmitted synchronized to a clock derived from the receive line.

Dialer

This parameter specifies the method of dialing used by the DAP. When Autosense is enabled, the DAP automatically determines the proper dialing method. It begins by dialing the stored telephone number using tone dialing. If a dial tone is detected after the first digit, it redials the number using pulse dialing. If your calls are placed through a PBX system that does not provide standard dial tones, you must then select Tone or Pulse, depending on your calling facility.

Wait to Dial

This parameter specifies how long the DAP waits to dial a call after it goes off-hook. If a dial tone is provided at your calling facility, select **Tone**. This instructs the DAP to initiate dialing when it detects a dial tone. If a dial tone is unavailable, you can select a 2-, 10-, or 20-second dialing delay.

Call Progress

This parameter specifies whether the DAP observes call progress tones when establishing a dial backup connection. By observing these tones (busy signal, ringing, etc.) while a call is in progress, the DAP can reduce the time needed to verify a failed connection. In areas where call progress tones are not available, set this parameter to **Disabled**.

Automatic Dial

This parameter specifies the conditions that cause the DAP to automatically place dial backup telephone calls. You can select from the following options:

- **DDS Down** - DDS goes down due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing for a user-selectable time period.
- **No Signal** - an invalid DDS signal is received from the network.
- **Network Down** - the DAP dials after the DDS network goes down or an invalid signal is received from the network. This is the recommended setting for the originating DAP.
- **DTR** - The DAP dials when the DTR signal is active. This setting allows external routers and FRADs to originate dial backup calls.
- **None** - automatic dialing is disabled. This is the recommended setting for the answering DAP.

The DAP will not automatically dial when it is in a test state such as End-to-End Loops.

Automatic Dial Timer

This parameter allows you to select how long the specified conditions must exist before the DAP automatically places dial backup calls. The options are 5, 15, 30, and 60 seconds. The recommended setting is 30 seconds.

Switch to Dial

This parameter specifies whether the DTR signal must be present for the DAP to switch communication to the dial backup telephone line.

Automatic Disconnect

This parameter specifies the conditions that cause the DAP to automatically disconnect a dial backup connection. You can select from the following options:

- **No DTR** - the DAP disconnects the call after the dial backup port's DTR signal goes Off.
- **None** - the DAP disconnects the call when the DCD signal goes Off for longer than 5 seconds.

Retry Attempts

This parameter specifies the maximum number of times that the DAP will redial a call if the previous attempt is unsuccessful. The Excalibur Multirate DAP allows you to store six telephone numbers: one permanent, four alternate, and one temporary. The possible settings for each phone number range from 0 (retries disabled) through 9. If this parameter is set to 0 and an automatic dial attempt fails, a Return to Normal (RTN) function must be performed from the front panel of the local unit before the unit will automatically dial again. (See "RTN Function" in Chapter 7 for instructions.) From the CMS system console, a Re-enable Auto Retries, under the Excalibur Dial Restoral function, must be performed before the unit will automatically dial again.

Dedicated Line Test

This parameter specifies whether the DAP continuously monitors the dedicated line while it is operating over the dial backup line. The DAP monitors the same conditions that it uses for DDS Up in the Line Statistics submenu for the selected time interval. It also monitors for the presence of multiport framing. If the DDS network is up for the specified time and multiport framing is present, the DAP disconnects the dial backup line and returns data transmission to the dedicated line.

Line Test Interval

This parameter specifies the duration of the dedicated line test. The possible settings are 5, 10, 15, and 30 minutes.

DCD Threshold

This parameter specifies the level range that incoming dial line signals must fall within to activate the DAP's DCD signal. The normal range is 0 to -38 dBm and the extended range is 0 to -48 dBm.

Answer

This parameter specifies the conditions that cause the DAP to automatically answer dial line calls. You can select from the following options:

- **Always** - the DAP always answers calls.
- **Never** - automatic answering is disabled.
- **DDS Line or Local Loop Down** - the DAP only answers calls when the DDS line goes down (due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing) or when the an invalid DDS signal is received from the network
- **No Signal** - the DAP only answers calls when an invalid DDS signal is received from the network.

The DAP constantly monitors the dial line for a ringing signal. When ringing is detected, the DAP automatically answers the call in response to the selected condition. When the dial backup connection is successfully established, the DAP displays the message `Switched To Dial` on the front panel followed by an audible beep. When automatic answering is disabled or when the selected condition is not present, the DAP informs the front panel that ringing is detected, but it will not answer the call.

The options listed above are provided with software revision number SSC0900 or above. These revisions are compatible with previous revisions. Previous revisions only provide the settings `Enabled` and `Disabled`. If you upgrade a unit with software revision number SSC0839, you do not have to reconfigure the DAP. The unit will retain its parameter settings.

You can fully configure the Answer Calls feature from a CMS 400 network management system equipped with software revision number 4.0 or above. If it is equipped with a software revision number lower than 4.0, configure this feature by using the WAN Control, Excalibur Front Panel function. It is necessary to do so because an older CMS network management system only provides the settings `Enabled` and `Disabled`. If you configure Answer Calls from an older system, depending on the previous settings, the `Disabled` selection may select `Never` (automatic answering is disabled) or `DDown` (answer only when the DDS line is down or the local loop signal is lost). The `Enabled` selection may select `Alwys` (always answer calls) or `Nosig` (answer only when the local loop signal is lost).

Answerback

This parameter enables/disables the Answerback feature. When enabled, this parameter allows the DAP to recover when the quality of the dial line signal degrades past an acceptable level. When the DAP detects unacceptable signal quality, it briefly drops its Clear-to-Send signal and clamps all received data to a Marking (I's) state. It then sends a training sequence to the far-end unit. When the far-end unit receives the training sequence, it sends a training sequence to the first DAP. If the training sequences are successful, normal operation resumes. When the Answerback parameter is disabled and the quality of the dial line degrades past an acceptable level, the unit is unable to start a training sequence.

Transmit Equalizer

This parameter enables/disables the DAP's statistical transmit equalizer. When Stat is selected, this equalizer provides additional compensation to the transmit signal, improving performance on most lines. When Flat is selected, no additional compensation is provided.

Program Resistor

This parameter appears on the screen only when the Compliance parameter is set for Programmable Mode. Press the button beneath Ok. This allows a limiting resistor in the telephone company's data jack to program the DAP so that the signal level received at the central office does not exceed -12 dBm. This parameter must be set each time the unit is connected to a different data jack.

Note: This parameter must be set to comply with FCC Part 68/DOC CS-03 requirements. Failure to set this parameter may cause the telephone company to request that you disconnect the equipment.

Port RTS-DCD Simulation

This parameter enables/disables V.13 RTS-DCD Simulation when dial backup connections are established.

Switched 56 Dial Parameters

The DTE data rate can not be modified when the DAP is in dial backup operation. The rate selected for normal operation is maintained during dial backup operation with two exceptions:

- 64 Kbps is automatically changed to 56 Kbps (CC64 operating mode).

- 57.6 and 56 Kbps are automatically changed to 52.8 Kbps (C64NI operating mode).

When the DAP is in dial backup operation and the DTE data rate is 56 Kbps, no secondary channel is provided. Therefore, if the unit is a remote and a CMS link exists during normal operation (all operating modes except CC64), the link is lost when the unit is in dial backup operation. When the DAP is in dial backup operation and the DTE data rate is 52.8 Kbps or below, a non-interruptive secondary channel is provided. This channel is compatible with the Milgo T7 channel. For remote units, the DAP provides an NMI connector for Second Level T7 devices except when the operating mode is DDS.

The Dial submenu contains the parameters which control the operation of the Switched 56 IDBU feature. Table 5-14 lists these parameters along with their possible settings. Parameters are listed in the order they appear on the screen. The screen abbreviation for each parameter is shown in parenthesis.

Table 5-14. Switched 56 Dial Parameters

Parameter	Possible Settings
Call Progress (Prgrs)	Enabled, Disabled
Automatic Dial (ADial)	DDS Down, No Signal, Network Down, DTR, None
Automatic Dial Timer (ADTim)	5, 15, 30, 60 seconds
Switch to Dial (SDial)	Always, DTR On
Automatic Disconnect (Disc)	No DTR, None
Retry Attempts (Retry)	0 to 9
Dedicated Line Test (LTest)	None, DDS Up
Line Test Interval (LTInv)	5, 10, 15, 30 minutes
Answer Calls (Answr)	Always, Never, DDS Line or Local Loop Down, No Signal
Port RTS-DCD Simulation (Port)	Disabled, V.13, Out of Band
Ring Detect (RingD)	Short, Long

The following sections explain the function of each Dial parameter.

Call Progress

This parameter specifies whether the DAP observes call progress tones when establishing a dial backup connection. By observing these signals (busy signal, ringing, etc.) while a call is in progress, the DAP can reduce the time needed to verify a failed connection. This parameter is only operational when the DAP is connected to Sprint's Enhanced Switched 56 Service.

Automatic Dial

This parameter specifies the conditions that cause the DAP to automatically place dial backup telephone calls. You can select from the following options:

- **DDS Down** - DDS goes down due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing for a user-selectable time period.
- **No Signal** - an invalid DDS signal is received from the network.
- **Network Down** - the DAP dials after the DDS network goes down or an invalid signal is received from the network. This is the recommended setting for the originating DAP.
- **DTR** - The DAP dials when the DTR signal is active. This setting allows external routers and FRADs to originate dial backup calls.
- **None** - automatic dialing is disabled. This is the recommended setting for the answering DAP.

Note: The DAP will not automatically dial when it is in a test state such as End-to-End Network Loops.

Automatic Dial Timer

This parameter allows you to select how long the specified conditions must exist before the DAP automatically places dial backup calls. The options are 5, 15, 30, and 60 seconds. The recommended setting is 30 seconds.

Switch to Dial

This parameter specifies whether the DTR signal must be present for the DAP to switch communication to the dial backup telephone line.

Automatic Disconnect

This parameter specifies the conditions that cause the DAP to automatically disconnect a dial backup connection. You can select from the following options:

- **No DTR** - the DAP disconnects the call after the DTR signal from the dial backup port's DTE goes Off.
- **None** - the DAP disconnects the call when multiport framing is lost for longer than 90 seconds.

Note: A network disconnect signal overrides the Automatic Disconnect parameter setting.

Retry Attempts

This parameter specifies the maximum number of times that the DAP will redial a call if the previous attempt is unsuccessful. The Excalibur Multirate DAP allows you to store six telephone numbers: one permanent, four alternate, and one temporary. The possible settings for each phone number range from 0 (retries disabled) through 9. If this parameter is set to 0 and an automatic dial attempt fails, a Return to Normal (RTN) function must be performed from the front panel of the local unit before the unit will automatically dial again. (See "RTN Function" in Chapter 7 for instructions.) From the CMS system console, a Re-enable Auto Retries, under the Excalibur Dial Restoral function, must be performed before the unit will automatically dial again.

Dedicated Line Test

This parameter specifies whether the DAP continuously monitors the dedicated line while it is operating over the dial backup line. When the Network parameter is set to point-to-point, the DAP monitors for end-to-end dedicated line connectivity. If there is end-to-end connectivity for the specified time, the DAP disconnects the dial backup line and returns data transmission to the dedicated line. When the Network parameter is set to multipoint, the DAP monitors the same conditions that it uses for DDS Up in the Line Statistics submenu for the selected time interval. The DAP does NOT monitor for the presence of multiport framing. If the DDS network is up for the specified time, the DAP disconnects the dial backup line and returns data transmission to the dedicated line.

Note: This parameter must be set to None when the service is set for LADC or LDM and the clocking is set to External.

Line Test Interval

This parameter specifies the duration of the dedicated line test. The possible settings are 5, 10, 15, and 30 minutes.

Answer

This parameter specifies the conditions that cause the DAP to automatically answer dial line calls. You can select from the following options:

- **Always** - the DAP always answers calls.
- **Never** - automatic answering is disabled.
- **DDS Line or Local Loop Down** - the DAP only answers calls when the DDS line goes down (due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing) or when an invalid DDS signal is received from the network.
- **No Signal** - the DAP only answers calls when an invalid DDS signal is received from the network.

The DAP constantly monitors the network interface for an off-hook (ringing) state. When ringing is detected, the DAP automatically answers the call in response to the selected condition. When the dial backup connection is successfully established, the DAP displays the message *Switched To Dial* on the front panel followed by an audible beep. When automatic answering is disabled or when the selected condition is not present, the DAP informs the front panel that ringing is detected, but it will not answer the call.

The options listed above are provided with software revision number SSC0900 or above. These revisions are compatible with previous revisions. Previous revisions only provide the settings *Enabled* and *Disabled*. If you upgrade a unit with software revision number SSC0840, you do not have to reconfigure the DAP. The unit will retain its parameter settings.

You can fully configure the Answer Calls feature from a CMS 400 network management system equipped with software revision number 4.0 or above. If it is equipped with a software revision number lower than 4.0, configure this feature by using the WAN Control, Excalibur Front Panel function. It is necessary to do so because an older CMS network management system only provides the settings *Enabled* and *Disabled*. If you configure Answer Calls from an older system, depending on the previous settings, the *Disabled* selection may select *Never* (automatic answering is disabled) or *DDown* (answer only when the DDS line is down or the local loop signal is lost). The *Enabled* selection may select *Alwys* (always answer calls) or *Nosig* (answer only when the local loop signal is lost).

Port RTS-DCD Simulation

This parameter specifies the RTS-DCD simulation method for each port or shared group when dial backup connections are established. The options are V.13, Out of Band, and Disabled.

Note: When operating with another DAP equipped with ISDN IDBU, do not set this parameter to out of band. ISDN IDBU does not provide out of band RTS-DCD simulation.

Ring Detect

This parameter specifies the method the DAP uses to answer calls. Two options are available:

- **Short** - AT&T standard. Short ring detection is as specified in the AT&T publication on Switched 56 Kbps operation. For short ring detection logic, timing is +/-4 milliseconds. Data Mode Idle (DMI) must occur for 72 milliseconds before it is considered an incoming call (ring indication).
- **Long** - The long ring detection logic is designed to minimize sensitivity to noise which could cause erroneous recognition of incoming calls. However, it does not comply with the AT&T Specification. DMI must occur for 1 full second before it is considered an incoming call (ring indication).

This parameter should be set to **Long** for most applications.

ISDN Dial Parameters

The Dial submenu contains the parameters which control the operation of the ISDN IDBU feature. Table 5-15 lists these parameters along with their possible settings. Parameters are listed in the order they appear on the screen. The screen abbreviation for each parameter is shown in parenthesis.

Table 5-15. ISDN Dial Parameters

Parameter	Possible Settings
Switch Type (Swch)	National ISDN-1, Northern Telecom DMS-100, AT&T 5ESS
Dial Mode (DMode)	Excalibur ISDN, Excalibur Switched 56, ISDN*
Transmit Clock (TxClk)	External, Slave
Call Progress (Prgrs)	Enabled, Disabled
Automatic Dial (ADial)	DDS Down, No Signal, Network Down, DTR, None
Automatic Dial Timer (ADTim)	5, 15, 30, 60 seconds
Switch to Dial (SDial)	Always, DTR On
Automatic Disconnect (Disc)	No DTR, None
Retry Attempts (Retry)	0 to 9
Dedicated Line Test (LTest)	None, DDS Up
Line Test Interval (LTInv)	5, 10, 15, 30 minutes
Answer Calls (Answr)	Always, Never, DDS Line or Local Loop Down, No Signal
Port RTS-DCD Simulation (Port)	Disabled, V.13

* This parameter appears on the screen only when the service is set for DDS, DDS-SC, CC64, LDM, or LADC.

The following sections explain the function of each Dial parameter.

Switch Type

This parameter allows you to define the switch type and software protocol. This parameter setting must correspond with your dial line connection. The available options are:

- **NI - 1** - National ISDN-1 standard.
- **NT100** - Northern Telecom DMS-100 at a functional Pvc0 protocol.
- **AT&T** - AT&T 5ESS with Custom, 5E6, or later software.

Dial Mode

This parameter allows you to select the dial mode. When EISDN is selected, you can enable the Route Secondary Channel To Dial feature and the dial backup security feature during dial backup operation. Select ESw56 when operating with another DAP with SW56 IDBU or when the telephone company only provides 56 Kbps for customer data on the ISDN service. Select ISDN when the service is set for DDS, DDS-SC, CC64, LDM, or LADC.

Transmit Clock

This parameter specifies the source of timing signals for the dial backup port's transmit clock. The available options are:

- **External** - the transmit clock derives timing from an external clock source. When the DAP is operating over the DDS network and the External option is selected for timing, the external transmit clock must be synchronized with the network clock. Only phase differences are allowed when this option is selected. The clock signals must be frequency locked.
- **Slave** - receive (Rx) channel timing is slaved to the dial-up Rx line and transmit (Tx) channel timing is slaved to the Rx channel timing. Data is transmitted synchronized to a clock derived from the receive line.

Call Progress

This parameter specifies whether the DAP observes call progress messages when establishing a dial backup connection. By observing these signals (busy, ringing, etc.) while a call is in progress, the DAP can reduce the time needed to verify a failed connection.

Automatic Dial

This parameter specifies the conditions that cause the DAP to automatically place dial backup telephone calls. You can select from the following options:

- **DDS Down** - DDS goes down due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing for a user-selectable time period.
- **No Signal** - an invalid DDS signal is received from the network.
- **Network Down** - the DAP dials after the DDS network goes down or an invalid signal is received from the network. This is the recommended setting for the originating DAP.
- **DTR** - The DAP dials when the DTR signal is active. This setting allows external routers and FRADs to originate dial backup calls.
- **None** - Automatic dialing is disabled. This is the recommended setting for the answering DAP.

Note: The DAP will not automatically dial when it is in a test state such as Channel Network Loops.

Automatic Dial Timer

This parameter allows you to select how long the specified conditions must exist before the DAP automatically places dial backup calls. The options are 5, 15, 30, and 60 seconds. The recommended setting is 30 seconds.

Switch to Dial

This parameter specifies whether the DTR signal must be present for the DAP to switch communication to the dial backup telephone line.

Automatic Disconnect

This parameter specifies the conditions that cause the DAP to automatically disconnect a dial backup connection. You can select from the following options:

- **No DTR** - the DAP disconnects the call after the dial backup port's DTR signal goes Off or when it receives a network disconnect signal.
- **None** - the DAP disconnects the call when it receives a network disconnect signal.

Note: A network disconnect signal overrides the Automatic Disconnect parameter setting.

Retry Attempts

This parameter specifies the maximum number of times that the DAP will redial a call if the previous attempt is unsuccessful. The Excalibur Multirate DAP allows you to store six telephone numbers: one permanent, four alternate, and one temporary. The possible settings for each phone number range from 0 (retries disabled) through 9. If this parameter is set to 0 and an automatic dial attempt fails, a Return to Normal (RTN) function must be performed from the front panel of the local unit before the unit will automatically dial again. (See "RTN Function" in Chapter 7 for instructions.) From the CMS system console, a Re-enable Auto Retries, under the Excalibur Dial Restoral function, must be performed before the unit will automatically dial again.

Dedicated Line Test

This parameter specifies whether the DAP continuously monitors the dedicated line while it is operating over the dial backup line. The DAP monitors the same conditions that it uses for DDS Up in the Line Statistics submenu for the selected time interval. It also monitors for the presence of multiport framing. If the DDS network is up for the specified time and multiport framing is present, the DAP disconnects the dial backup line and returns data transmission to the dedicated line.

Note: This parameter must be set to None when the service is set for LADC or LDM and the clocking is set to External.

Line Test Interval

This parameter specifies the duration of the dedicated line test. The possible settings are 5, 10, 15, and 30 minutes.

Answer

This parameter specifies the conditions that cause the DAP to automatically answer dial line calls. You can select from the following options:

- **Always** - the DAP always answers calls.
- **Never** - automatic answering is disabled.

- **DDS Line or Local Loop Down** - the DAP only answers calls when the DDS line goes down (due to Out of Service codes, Abnormal Station codes, loss of multiport framing, or loss of network framing) or when an invalid DDS signal is received from the network.
- **No Signal** - the DAP only answers calls when an invalid DDS signal is received from the network.

The DAP constantly monitors the network interface for an off-hook (ringing) state. When ringing is detected, the DAP automatically answers the call in response to the selected condition. When the dial backup connection is successfully established, the DAP displays the message *Switched To Dial* on the front panel followed by an audible beep. When automatic answering is disabled or when the selected condition is not present, the DAP informs the front panel that ringing is detected, but it will not answer the call.

Port RTS-DCD Simulation

This parameter enables/disables V.13 RTS-DCD Simulation when dial backup connections are established.

Parameter Thresholds

The Parameter Threshold submenu allows you to define the thresholds for five line parameters and the Excessive Resynchronizations parameter. It allows you to set the timers for the Lost Communication and Regained Communication alarms. It also allows you to enable/disable the RTS/DCD antistreaming function and the DTE Power Fail alarm for each port or shared group. Table 5-16 lists each parameter and its default setting.

Note: It is recommended that you always set the Transmit Level to the default settings.

Table 5-16. Parameter Thresholds

Parameter	Default Settings
Transmit Level - Upper Bound	+15 dB, 3 sec
Transmit Level - Lower Bound	-05 dB, 3 sec
Receive Level - Upper Bound	-00 dB, 3 sec
Receive Level - Lower Bound	-34 dB, 3 sec

Table 5-16. Parameter Thresholds (Continued)

Parameter	Default Settings
Signal Quality	Good, 3 sec
Resync Limit	2 times, 5 min
Lost Communication Alarm Timer	60 sec
Regained Communication Alarm Timer	600 sec
RTS Antistreaming Timer	Disabled, 50 sec
DCD Antistreaming Timer	Enabled, 50 sec
DTE Power Fail Timer	Disabled, 10 sec

You can specify the amount of time the value of each line parameter can exceed its defined threshold before the DAP issues an alarm. The possible settings are 3, 5, 10, 15, 20, 43, 60, and 80 seconds

The Excessive Resynchronizations parameter allows you to define the number of times, from 1 to 16, a unit or circuit can be resynchronized before it is reported as an alarm condition. You can specify the amount of time, from 5 minutes to 60 minutes in 5-minute intervals, this condition can be active before the DAP issues an alarm. The alarm is only generated once even when multiple units are being resynchronized. A RTN (Return to Normal) function must be performed from the front panel before the alarm can be regenerated. (See "RTN Function" in Chapter 7 for instructions.)

A Lost Communication alarm condition occurs when the central unit in a multipoint/multidrop circuit loses communication with one of the remote units. This feature is only available when the service is set for DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to disabled. You can specify the amount of time, from 0 to 3900 seconds, this condition can be active before the DAP issues an alarm. The time period selected should be based on the number of units in the poll table since the number of polls to a given drop decreases as the number of drops increases. For example, a setting of 30 seconds for up to ten remote units in the poll table ensures that each unit receives three polls. The timer becomes inactive when the lost unit regains synchronization at which time a Regained Communication alarm condition occurs. You can specify the amount of time, from 0 to 3900 seconds, this condition can be active before the DAP issues an alarm. If a lost unit fails to regain synchronization, you can regenerate the alarm by performing a RTN (Return to Normal) function from the front panel of the central unit. (See "RTN Function" in Chapter 7 for instructions.)

The RTS Antistreaming Timer parameter allows you to specify the amount of time, from 1 to 255 seconds, RTS can be active before CTS is turned Off. If one DTE remains in an RTS active state, this function allows other DTEs running the same application on other units to continue to operate. When the RTS Antistreaming function is enabled, an antistreaming alarm is generated when the timer expires. The RTS Antistreaming Timer parameter is also used by the RTS Mode parameter in the RCP submenu.

The DCD Antistreaming Timer parameter allows you to specify the amount of time, from 1 to 255 seconds, DCD can be active before it is turned Off. This function acts as a backup to prevent an application from becoming stalled as a result of a missed V.13 DCD drop code or other similar condition caused by a line hit or a power failure. This function only operates when V.13 DCD Simulation is enabled. When the DCD Antistreaming function is enabled, an antistreaming alarm is generated when the timer expires. The DCD Antistreaming Timer parameter is also used by the DCD Mode parameter in the RCP submenu.

The DTE Power Fail Timer parameter allows you to specify the amount of time, from 1 to 255 seconds, that Transmit Data can have an invalid level before a DTE change of state alarm is issued. When this parameter is enabled, a DTE change of state alarm is issued when the timer expires.

User LED

The User submenu allows you to define a set of conditions that will cause the front panel **User LED** to light. You can select all, none, or any combination of the following conditions:

- An alarm is activated.
- A port is disabled by the Antistreaming function.
- An incoming call message is received.
- The DAP switches to dial backup operation.

To select a condition, follow these steps, starting from the Configuration Mode menu:

1. Press the > button and then press the button beneath **User**. The screen displays the User LED submenu. The possible conditions are displayed on the bottom line. If the condition is preceded by a minus (-) sign, it is currently disabled. If it is preceded by a plus (+) sign, it is enabled.

<div><div>L</div>Configuration Mode</div>				Escape	Top
ChnnlUserSystem					
1	2	3	4	<	>

- To change the current setting of a condition, press the button beneath it. The revised setting is then displayed.

<div> <div>L</div> <div>User LED = ON = OFF</div> </div>				Escape	Top
Alrm	AStr	Call	Dial		
1	2	3	4	<	>

<div> <div>L</div> <div>User LED = ON = OFF</div> </div>			
Alrm	AStr	Call	Dial

Turning off the User LED

When the **User LED** is lit, the User submenu contains an additional parameter labeled **Clear**. To turn off the **User LED**, press the button beneath this parameter.

You can also turn off the **User LED** by using the RTN (Return to Normal) function as described in the "RTN Function" section in Chapter 7.

Alias Parameter

The Alias submenu allows you to assign an alphanumeric name to the DAP. This name appears in the Top Level menu display. This feature is designed to make it easier to identify your DAPs in large central site installations.

To assign an Alias to the DAP, follow these steps, starting from the Configuration Mode menu:

- Press the button beneath **Alias**. The screen displays the current Alias on the top line, with a cursor located beneath the leftmost space.

<div> <div>L</div> <div>Configuration Mode</div> </div>				Escape	Top
DAP	Alias	RCP	PRate>		
1	2	3	4	<	>

2. Press the **1** or **2** button to scroll through the different letters, numbers, and symbols that can be entered in the space.

L Excalibur DAP				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

3. When the desired character is displayed, press the **>** button to move the cursor to the next space.

L Nxcalibur DAP				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

If you wish to insert a character between two entered characters or delete an entered character, follow Step 4. If you wish to copy an entered character, enter an M (without having to scroll to it), or enter a blank space, follow Step 5. If you do not wish to use any of these options, skip to Step 6.

4. Press the **4** button. You can now insert a character by pressing the **1** button, delete a character by pressing the **2** button, or delete a character and move the cursor one space to the left by pressing the **3** button. When finished, press the **4** button twice.

L Nxcalibur DAP				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

L Nxcalibur DAP			
INS	DEL	⌫ P	Other

- Press the **4** button twice. You can now copy a character into the next space by pressing the **1** button, enter an M in a space by pressing the **2** button, or enter a blank space by pressing the **3** button. When finished, press the **4** button.

L Nxcalibur DAP				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

L Nxcalibur DAP			
Cpy >	M	Bank	Other

- Continue in this manner until you have entered the desired Alias. Then press the **3** button to enter it into memory.

L NEW YORK BRANCH				Escape	Top
Inc	Dec	Accpt	Other		
1	2	3	4	<	>

System Submenu

The System submenu allows you to store a parameter configuration and swap it with the current configuration. It also allows you to replace the current parameter configuration with the factory default settings. You may also initiate a soft unit reboot from this submenu.

To store a configuration, you must first set all of the DAP parameters to the settings you wish to store. Then, follow these steps, starting from the Configuration Mode menu:

- Press the button beneath **System**.

L Configuration Mode				Escape	Top
Chnnl	User	System			
1	2	3	4	<	>

2. Press the button beneath Store.

<div style="border: 1px solid black; padding: 2px;"> <div style="display: flex; justify-content: space-between; align-items: center;"> L System Configuration </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> Store Swap Fctry Reset </div> </div>				Escape	Top
1	2	3	4	<	>

3. Press the **1** button to store the current parameter settings.

<div style="border: 1px solid black; padding: 2px;"> <div style="display: flex; justify-content: space-between; align-items: center;"> L Store System Config To </div> <div style="margin-top: 5px;"> Cfg 2 </div> </div>				Escape	Top
1	2	3	4	<	>

Once you have stored a configuration, you can then swap it with the current parameter configuration. To do so, enter the System submenu and press the button beneath Swap. Then press the **1** button. The DAP then powers down and powers up with the new parameter configuration in place. (Data is interrupted while the unit is reset and reinitialized.)

Note: It is recommended that you do not perform this function from the RCP.

If you wish to replace the current parameter configuration with the factory default settings, enter the System submenu and press the button beneath Fctry. Then press the button beneath Ok. (Data is interrupted while the unit is reset and reinitialized.)

If you wish to initiate a soft unit reboot, enter the System submenu and press the button beneath Reset. Then press the button beneath Ok. (Data is interrupted while the unit is reset and reinitialized.)

Chapter 6

On-Line Operation

Introduction

After you have properly installed the DAP and defined its operating parameters, it can begin transmitting data. This chapter describes the different procedures that you can perform while the DAP is operating on-line. These include monitoring current operating status, establishing dial backup connections, and sending call messages. This chapter also lists the different types of alarms that the DAP can report during on-line operation.

Monitoring Operating Status

The Excalibur Multirate DAP has extensive monitoring capabilities that let you check the current operating status of the local or remote DAP at the touch of a button. To monitor the DAP's operating status, follow these steps, starting from the Top Level menu:

1. Press the **1** or **2** button depending on which DAP (local or remote) you wish to monitor.

Note: Monitoring remote status is interruptive when the service is set for DDS.

<div>■ Excalibur DAP</div>				Escape	Top
Local	Remot	Addr	Serve >		

2. Press the **1** button.

<div>■ Local Mode</div>				Escape	Top
Stats	Conf	Diag	Dial >		

- Press the button beneath DAP. The screen displays the current operating status.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
DAP	Dial	Serve	Digt1 >		

<div> <div>L</div> <div>9.6</div> <div>TL 0dBm</div> <div>RL -11dB</div> </div>
Q=Best Dial=N Tst=N

The display shows the status of the following:

- 9.6 - indicates the DAP's operating speed (9.6 Kbps). Possible displays range from 2.4 to 64 Kbps. Actual speeds displayed are dependent on the service used. An OOS is displayed when an Out of Service code is being received from the network. Loop is displayed when a network service loop command is being received. In DDS-SC mode, an ASC is displayed when an Abnormal Station code is being received.
- TL - shows the DAP's transmit level in dBm. The transmit level is fixed for units equipped with the 15P09AA or Model D Aggregate card.
- RL - shows the DAP's approximate receive level insertion loss range in -dB for units equipped with the 15P09AA or Model D Aggregate card. For example, -11 dB indicates the received signal is less than 11 dB. Table 6-1 lists the receive level insertion loss ranges for each line rate. For units equipped with the Model A or C Aggregate card, RL shows the DAP's receive level in -dB.
- Q - shows the quality of the signal received from the telephone line. Receiving any network control code (except Control Mode Idle), a loss of multiport frame, and unknown control codes will cause the signal quality to degrade. Possible displays are Best, Good, Fair, Poor, and Off.
- Dial - indicates whether the DAP is in dial backup operation. If the unit is not equipped with the Analog, Switched 56, or ISDN IDBU option, Svc is displayed in place of Dial. Svc - shows the digital data service, LADC, or LDM line used. Possible displays are DDS, DDSNI, DDSSC, LADC, LDM, CC64, and C64NI.
- Tst - indicates whether a test is in progress.

Notes: LADC only appears on the screen for units equipped with the Model A or C Aggregate card.

The Excalibur Multirate DAP provides the transmit and receive levels for use as a reference, not as an absolute value. Accuracy is dependent on the data pattern and line conditions.

Press the **Escape** button to return to the Status submenu.

Table 6-1. Receive Level Insertion Loss Ranges

DDS Line Rate	Insertion Loss Range Values
2.4 Kbps	<7, <13, <18, <22, <27, <33, <38, <50
4.8 Kbps	<7, <12, <16, <22, <27, <33, <39, <50
9.6 Kbps	<5, <11, <16, <22, <27, <33, <37, <40
19.2 Kbps	<4, <11, <16, <22, <28, <33, <39, <50
56 Kbps	<4, <11, <17, <23, <29, <35, <42, <48, <50
72 Kbps (CC64)	<3, <11, <17, <23, <29, <36, <42, <48, <50

Note: The insertion loss range values are defined as being less than the listed number, but greater than the number listed to the immediate left.

- Press the button beneath Dial. This parameter appears on the screen only for units equipped with the Analog, Switched 56, or ISDN IDBU option. The screen displays the Analog, Switched 56 or ISDN IDBU's current operating status. For Analog IDBU, the display appears as follows:

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
DAP	Dial	Serve	Digt1 >		

<div> <div>L</div> <div>9.6 C TL -9dBm RL -17dBm</div> </div>			
Q=Best	Dial=N	Tst=N	

The display shows the status of the following:

- 9 . 6C - indicates the DAP's operating speed (9.6 Kbps, coded). Other possible values are 9 . 6U (9.6 Kbps, uncoded), 2 . 1 (2.1 Kbps), 2 . 4 (2.4 Kbps), 4 . 5 (4.5 Kbps), 4 . 8 (4.8 Kbps), 9 . 0C (9.0 Kbps, coded), 9 . 0U (9.0 Kbps, uncoded), 12 . 0 (12.0 Kbps), and 14 . 4 (14.4 Kbps). When the DAP is not in dial backup operation, Idle is displayed.
- TL - shows the DAP's transmit level in -dBm.
- RL - shows the DAP's receive level in -dBm.
- Q - shows the quality of the signal received from the telephone line. Possible displays are Best, Good, Fair, and Poor. When the DAP is not in dial backup operation, Off is displayed.
- Dial - indicates whether the DAP is in dial backup operation.
- Tst - indicates whether a test is in progress.

Note: The Excalibur Multirate DAP provides the transmit and receive levels for use as a reference, not as an absolute value. Accuracy is dependent on the data pattern and line conditions.

Press the **Escape** button to return to the Status submenu.

For Switched 56 IDBU, the display appears as follows:

L Status Mode				Escape	Top
DAP	Dial	Serve	Digtl >		

L 56 . 0 SW 56 Line = Up			
Q = Best	Dial = N	Tst = N	

The display shows the status of the following:

- 56 . 0 - indicates the IDBU's operating speed (56 Kbps) when the DAP is in dial backup operation. When the dial line is down, OOS is displayed.
- SW56 Line - indicates whether the dial backup line is operational.

- Q - shows the quality of the signal received from the dial backup line when the DAP is in dial backup operation. Possible displays are Best, Good, Fair, and Poor. When the DAP is not in dial backup operation, **** is displayed.
- Dial - indicates whether the DAP is in dial backup operation.
- Tst - indicates whether a test is in progress.

Press the **Escape** button to return to the Status submenu.

For ISDN IDBU, the display appears as follows:

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
DAP	Dial	Serve	Digitl >		
1	2	3	4	<	>

<div> <div>L</div> <div>64.0 ISDN Line = Up</div> <div>Q = Best Dial = N Tst = N</div> </div>

The display shows the status of the following:

- 64.0 - indicates the IDBU is configured for an operating speed of 64 Kbps. When the Dial Mode parameter in the Dial Configuration submenu is set to ES56, 56.0 (56 Kbps) is displayed when the IDBU's operating speed is 56 Kbps. When the dial line is down, OOS is displayed.
- ISDN Line - indicates whether the dial backup line is operational.
- Q - indicates whether the IDBU is in synchronization with the network and ready to place a call. When the DAP is in dial backup operation, Q shows the quality of the signal received from the dial backup line. A loss of multiport frame will cause the signal quality to degrade. Possible displays are Best, Good, Fair, and Poor. When the DAP is not in dial backup operation, Off is displayed.
- Dial - indicates whether the DAP is in dial backup operation.
- Tst - indicates whether a test is in progress.

Press the **Escape** button to return to the Status submenu.

5. Press the button beneath *Serve*. The top line of the screen displays the service used (DDSNI). The bottom line of the screen displays the DDS channel rate (19.2 Kbps) and the usable aggregate channel bandwidth (18.0 Kbps).

<div style="display: flex; justify-content: space-between; align-items: center;"> L Status Mode </div>				Escape	Top
DAP	Dial	Serve	Digtl >		
1	2	3	4	<	>

<div style="display: flex; justify-content: space-between; align-items: center;"> L Service = DDSNI </div>	
Rate=19.2 Usable=18.0	

Press the **Escape** button to return to the Status submenu.

6. Press the button beneath *Digtl*. The screen displays the status of the DTE interface signals. The bar following each signal name indicates the signal status. When the bar is in the up position, the signal is active. When the bar is in the down position, the signal is inactive. When a bar is in both the top and bottom positions, the signal is toggling (constantly changing).

Note: This is not a real time display.

<div style="display: flex; justify-content: space-between; align-items: center;"> L Status Mode </div>				Escape	Top
DAP	Dial	Serve	Digtl >		
1	2	3	4	<	>

<div style="display: flex; justify-content: space-between; align-items: center;"> L P1 9.6 DTR_ DSR_ RTS_ </div>	
CTS_ TxD_ TxC= DCD_ RxD_	

Press the **Escape** button to return to the Status submenu.

7. Press the > button.

<div>L</div> <div>Status Mode</div>				Escape	Top
DAP	Dial	Serve	Digtl >		
1	2	3	4	<	>

8. Press the button beneath Unit.

<div>L</div> <div>Status Mode</div>				Escape	Top
Digtl	Unit	Line	Analg >		
1	2	3	4	<	>

9. Press the button beneath the unit information you wish to display: Serl# (unit serial number), Part#, or Revsn (software revision level). The screen then displays this information.

Note: For units equipped with the ISDN IDBU option, the software revision level of the ISDN IDBU board is also displayed.

<div>L</div> <div>Unit Information</div>				Escape	Top
Serl#	Part#	Revsn			
1	2	3	4	<	>

<div>L</div> <div>Software Revision:</div>			
SSC1040			

Press the **Escape** button twice to return to the Status submenu.

10. Press the button beneath Analg.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
◀ Digtl	Unit	Line	Analg >		
1	2	3	4	<	>

11. The screen's top line displays the status of the most recently selected analog channel parameter, which in this case is the transmit level. The bottom line displays the parameters that you can monitor: TxLvl (transmit level), RxLvl (receive level), and SQlty (signal quality). The transmit level reports at the default level settings as described under "Parameter Thresholds" in Chapter 5.

<div> <div>L</div> <div>TxLvl = 1.1 Vlt peak</div> </div>				Escape	Top
TxLvl	RxLvl	SQlty			
1	2	3	4	<	>

12. Press the button beneath RxLvl. The screen displays this parameter's status followed (in brackets) by the predefined lower and upper thresholds, respectively.

<div> <div>L</div> <div>Analog Channel Status</div> </div>				Escape	Top
TxLvl	RxLvl	SQlty			
1	2	3	4	<	>

<div> <div>L</div> <div>RxLvl = -3 -34..0 dB</div> </div>			
TxLvl	RxLvl	SQlty	

13. Press the button beneath SQlty. The screen displays this parameter's status followed by its predefined threshold.

<div> <div>L</div> <div>Analog Channel Status</div> </div>				Escape	Top
TxLvl	RxLvl	SQlty			
1	2	3	4	<	>

<div> <div>L</div> <div>S Q = B e s t T h r = F a i r</div> </div>			
TxLvl	RxLvl	SQlty	

Press the **Escape** button to return to the Status submenu.

14. Press the > button.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
Digtl	Unit	Line	Anal g >		
1	2	3	4	<	>

15. Press the button beneath Tests. The screen indicates whether any tests are in progress.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
<Anal g	Tests	Alarm	Drops >		
1	2	3	4	<	>

<div> <div>L</div> <div>No Tests</div> <div>are in progress</div> </div>			
--	--	--	--

Press the **Escape** button to return to the Status submenu.

16. Press the > button.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
<div> <div><Analg Tests Alarm Drops ></div> </div>				<	>
1	2	3	4		

17. Press the button beneath Chnnl. This parameter allows you to view channel speeds and port assignments for multidrop operation. This parameter appears on the screen only when the service is set for DDSNI and the Multiport Framing parameter is enabled.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
<div> <div><Drops Chnnl</div> </div>				<	>
1	2	3	4		

18. Press the button beneath Speed.

<div> <div>L</div> <div>Channel Status</div> </div>				Escape	Top
<div> <div>Speed Assgn</div> </div>				<	>
1	2	3	4		

19. Press the button beneath the channel you wish to monitor. (If you want to monitor channel 5 or 6, first press the > button.)

<div> <div>L</div> <div>C 1 = 1200</div> </div>				Escape	Top
<div> <div>C 1 C 2 C 3 C 4 ></div> </div>				<	>
1	2	3	4		

<div> <div>L</div> <div>C 2 = 1200</div> </div>			
<div> <div>C 1 C 2 C 3 C 4 ></div> </div>			

Press the **Escape** button to return to the Channel Status submenu.

20. Press the button beneath **Assgn**. The screen then displays the port's multidrop channel assignment. If a name has been assigned to the channel, the name will appear in place of the channel number.

<div> <div>L</div> <div>Channel Status</div> </div>				Escape	Top
Speed	Assgn				
1	2	3	4	<	>

<div> <div>L</div> <div>Port assigned to</div> <div>C 1</div> </div>
--

Line Quality Statistics

The Line Quality Statistics (LQS) feature allows you to measure and display the quality of a transmission line from a CMS system console or the DAP's front panel. This feature provides information that allows you to measure the percentage of time your network is available for use and allows you to identify specific digital line problems and bad lines. When troubleshooting networks, DAP diagnostic functions can be used in conjunction with information derived from LQS for isolating problems as described in Chapter 7.

From a CMS system console, you can monitor historical graphic displays of the following line availability statistics:

- Percentage of time transmit levels, receive levels, and signal quality are within predefined thresholds.
- Percentage of time the DDS circuit is available for use.
- Percentage of time the DAP is receiving a valid signal from the network.
- Number of Out of Service codes, Abnormal Station codes, network framing errors, and unknown control codes received.
- Number of multiport/multidrop resynchronizations for each drop and total number of multiport/multidrop resynchronizations.
- Number of times the central DAP has resynchronized the entire network (global resync count).
- The address of any remote unit the central unit has lost communication with on a multiport/multidrop circuit.

- Number of seconds receive line fault conditions and active network service loops occur.

From the DAP's front panel, you can monitor displays of the following line availability statistics:

- Percentage of time transmit levels, receive levels, and signal quality are within predefined thresholds.
- Percentage of time the DDS circuit is available for use.
- Percentage of time the DAP is receiving a valid signal from the network.
- Number of multipoint/multidrop resynchronizations for each drop.
- Number of times the central DAP has resynchronized the entire network (global resync count).
- The address of any remote unit the central unit has lost communication with on a multipoint/multidrop circuit.

To monitor the DAP's line availability statistics from the front panel, follow these steps, starting from the Top Level menu:

1. Press the **1** or **2** button depending on which DAP's (local or remote) line availability statistics you wish to view.

T Excalibur DAP				Escape	Top
Local	Remot	Addr s	Serve >	<	>
1	2	3	4		

2. Press the **1** button.

L Local Mode				Escape	Top
Stats	Conf g	Diag	Dial >	<	>
1	2	3	4		

3. Press the > button.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
D A P	Dial	Serve	Digtl >		
1	2	3	4	<	>

4. Press the button beneath Line.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
< Digtl	Unit	Line	Anal g >		
1	2	3	4	<	>

5. Press the button beneath Level. The screen then displays the percentage of time the Receive Level, Transmit Level, and Signal Quality have all been within their predefined thresholds. The information on this screen is continuously updated. This display shows that the levels have been up 95 percent during the last 0 days, 8 hours, 3 minutes, and 54 seconds.

The DAP can store up to 24 intervals of line statistics. The default interval is one hour, but the interval can be programmed from CMS for longer or shorter time periods. The DAP stores 24 intervals of the amount of time selected plus the current interval. For example, if one hour is selected, the DAP stores 24 hours plus the current hour interval. The maximum time displayed will never exceed 1 day, 0 hours, 59 minutes, and 59 seconds. The next display will show 1 day, 0 hours, 0 minutes, and 0 seconds. When the 25th interval is completed, the unit discards the oldest interval so that only the most recent 24 intervals are stored. If the interval was programmed from CMS for one day, the maximum time displayed would never exceed 24 days, 23 hours, 59 minutes, and 59 seconds.

<div> <div>L</div> <div>Line Statistics</div> </div>				Escape	Top
Level	SQ	DDS	Signal >		
1	2	3	4	<	>

<div> <div>L</div> <div>Level Up 95.0 % for:</div> </div>			
0 D,	8 H,	3 M,	54 S

Press the **Escape** button to return to the Line Statistics submenu.

6. Press the button beneath SQ. The screen then displays the percentage of time the Signal Quality has been within its predefined threshold. The screen continuously updates this information.

<div> <div>L</div> <div>Line Statistics</div> </div>				Escape	Top
Level	SQ	DDS	Signal >		
1	2	3	4	<	>

<div> <div>L</div> <div>SQ Up 95.0 % for:</div> </div>			
0 D,	8 H,	3 M,	54 S

7. Press the button beneath DDS. The screen then displays the percentage of time DDS has been up. The screen continuously updates this information.

<div> <div>L</div> <div>Line Statistics</div> </div>				Escape	Top
Level	SQ	DDS	Signal >		
1	2	3	4	<	>

<div> <div>L</div> <div>DDS Up 95.0 % for:</div> </div>			
0 D,	8 H,	3 M,	54 S

Any of the following conditions cause DDS to be down:

- Out of Service code is received.
- Abnormal Station code is received when the service is set for DDS-SC.
- Line is not connected to unit.
- Invalid local loop framing is received from the network when the service is set for DDS-SC.
- Unknown control codes are received from the network.
- Network service loop is active.

Press the **Escape** button to return to the Line Statistics submenu.

8. Press the button beneath Signl. The screen then displays the percentage of time that a valid signal has been received from the network. The screen continuously updates this information.

<div> <div>L</div> <div>Line Statistics</div> </div>				Escape	Top
Level	SQ	DDS	Signl >		
1	2	3	4	<	>

<div> <div>L</div> <div>Sig Up 95.0 % for:</div> <div>0 D, 8 H, 3 M, 54 S</div> </div>
--

Any of the following conditions causes an invalid signal:

- Line is not connected to unit.
- Invalid local loop framing is received from the network when the service is set for DDS-SC.
- Unknown control codes are received from the network.
- No signal is received from the network.

Press the **Escape** button to return to the Line Statistics submenu.

9. Press the > button.

<div> <div>L</div> <div>Line Statistics</div> </div>				Escape	Top
Level	SQ	DDS	Signl >		
1	2	3	4	<	>

10. If you wish to cancel the current line statistics and reset them to zero, press the button beneath **Reset**. The screen then displays this information. This function also resets the unit and global resync counters described in Step 15.

<div>L</div> Line Statistics				Escape	Top
< Reset					
1	2	3	4	<	>

<div>L</div> Line Statistics Reset			
Press ESC			

Press the **Escape** button two times to return to the Status submenu.

11. Press the **>** button.

<div>L</div> Status Mode				Escape	Top
< Digtl Unit Line Analg >					
1	2	3	4	<	>

12. Press the button beneath **Drops**. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to Central, and the Network parameter is set to Multipoint in the DAP Configuration submenu.

<div>L</div> Status Mode				Escape	Top
< Analg Tests Alarm Drops >					
1	2	3	4	<	>

13. Press the button beneath Addr_s to display the T7 address of all the remote units on the multidrop line that are in synchronization with the central unit.

L Drop Status				Escape	Top
Addr _s		Resyn	LComm		
1	2	3	4	<	>

L	001	002	003	004	005	006
---	-----	-----	-----	-----	-----	-----

Press the **Escape** button to return to the Drop Status submenu.

14. Press the button beneath Resyn.

L Drop Status				Escape	Top
Addr _s		Resyn	LComm		
1	2	3	4	<	>

15. Press the button beneath Unit. The screen's top line displays the T7 address of the first remote unit on the multidrop line and the number of resynchronizations that have occurred to that T7 address. If you wish to reset the number of resynchronizations to zero, enter the Line Statistics submenu and press the button beneath Reset as described in Step 8. The number of unit and global resynchronizations and the line statistics will be reset to zero.

L Resync Count				Escape	Top
Unit		lobl			
1	2	3	4	<	>

L	Addr _s =001		Resyn=000	
Next		Prev		

16. Press the button beneath **Next** to display the T7 address and the number of resynchronizations for the next remote unit on the multidrop line.

<div>L</div> Addr s = 0 0 1 Res y n = 0 0 0				Escape	Top
Next Prev					
1	2	3	4	<	>

Press the **Escape** button to return to the Resync Count submenu.

17. Press the button beneath **Glob1**. The bottom line of the screen displays the number of times the central unit has resynchronized the entire network.

<div>L</div> Resync Count				Escape	Top
Unit lob1					
1	2	3	4	<	>

<div>L</div> lobal Resync Count			
2			

Press the **Escape** button two times to return to the Drop Status submenu.

18. Press the button beneath **LComm** to display the address of any remote unit the central unit has lost communication with on a multipoint/multidrop circuit. This parameter only appears on the screen when the service is set to DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to disabled.

<div>L</div> Drop Status				Escape	Top
Addr s Res y n L C o m m					
1	2	3	4	<	>

<div>L</div> No units are			
out of communication _			

Press the **Escape** button two times to return to the Status submenu.

Alarms

The Excalibur Multirate DAP reports a variety of alarm conditions to alert you to problems in the network. You can configure the DAP to sound a beeper and/or light the **User LED** when an alarm is reported. The alarm message is displayed on the LCD screen.

The following conditions cause an alarm to be reported:

- **External Alarm** - caused by the occurrence of a customer defined external event that is sensed by the DAP. The event that triggers this alarm is programmable to active high or active low.
- **Out of Service** - indicates failures within the higher order facilities of the DDS network. This alarm is transmitted after the unit receives Out of Service sequences from the DDS network for at least 1 second. Refer to AT&T Publication 62310 for a description of Out of Service. This alarm is usually generated to the CMS system by a central unit since any remote unit may not be able to transmit through the network.
- **DTE Change of State** - occurs when the DTE interface has an invalid signal level (indicating loss of power to the DTE) or the signal level at the DTE interface regains a valid level (indicating power has been restored to the DTE). The DTE Transmit Data signal is monitored to determine if an alarm condition exists.
- **Service Loop** - generated when a Network Service Loop condition is initiated or terminated. Service Loops are used by the service provider to test the line from the central office to the central or remote units. This alarm informs the upstream device when the unit goes into a line loopback and when the test is terminated. During the test, communication with downstream devices is not possible since the network is not available. Therefore, this alarm should only be received from a central unit.
- **Transmit Loop Fault** - generated by the DAP if the far-end unit is not transmitting properly. This alarm is only available when the service is set for DDS-SC.
- **Receive Loop Fault** - generated by the DAP if it is not receiving a signal or the correct framing pattern from the network due to local loop (DDS to User) or network failure, or if it is detecting unknown control codes from the network. This alarm is sent when any of these conditions is detected for at least 1 second.

- Call - is a message produced by the operator from a DAP to the NMC. Call is not available when the service is set for DDS or Clear Channel 64 Kbps. This alarm provides a means of communication between the operator at the DAP site and the operator at the controller station. This alarm is not stored in the alarm buffer.
- Downstream Power Fail - generated by the remote DAP when it detects a unit has lost power. The alarm is sent when the Digital Power Fail Input (DPFI) has been active for 600 milliseconds.
- Analog Parameter Out of Range - generated when any Analog parameter (Transmit Level, Receive Level, or Signal Quality) exceeds its threshold setting for the amount of time selected.
- Framing Loss - generated by the DAP if it is not receiving Racal's proprietary framing from the far-end unit. The alarm is sent when this condition is detected for at least 1 second. This framing is required for non-interruptive operation. This alarm is only available when the service is set for DDSNI or C64NI.
- Transmit Channel Streaming - generated by the DAP when RTS is active for longer than the amount of time selected in the Parameter Threshold submenu and the RTS Mode parameter in the RCP submenu is set to Switched.
- Receive Channel Streaming - generated by the DAP when DCD is active for longer than the amount of time selected in the Parameter Threshold submenu and the DCD Mode parameter in the RCP submenu is set to Switched.
- Transmit Channel Idle - generated by the DAP when RTS is inactive for longer than the amount of time selected in the Parameter Threshold submenu and the RTS Mode parameter in the RCP submenu is set to Constant.
- Receive Channel Idle - generated by the DAP when DCD is inactive for longer than the amount of time selected in the Parameter Threshold submenu and the DCD Mode parameter in the RCP submenu is set to Constant.
- Antistreaming Started - generated when RTS is active for longer than the amount of time selected in the Parameter Threshold submenu and the antistreaming function is enabled.
- Antistreaming Stopped - generated when RTS goes inactive after antistreaming starts.
- Excessive Resynchronizations - generated by the DAP when the user-selected number of resynchronizations occurs for longer than the amount of time selected in the Parameter Threshold submenu.
- Lost Communication - generated by the central DAP in a multidrop network when communication is lost with a remote unit for longer than the amount of time selected in the Parameter Threshold submenu. This alarm is only available when the service is set for DDSNI and the Automatic Poll parameter is disabled.

- **Regained Communication** - generated by the central DAP in a multidrop network when communication is regained with a remote unit for longer than the amount of time selected in the Parameter Threshold submenu. This alarm is only available when the service is set for DDSNI and the Automatic Poll parameter is disabled.
- **Diagnostics Started** - generated when the secondary channel has been activated to communicate with a far-end unit. This alarm is only available when the service is set for DDS. It is not stored in the alarm buffer.
- **Diagnostics Stopped** - generated when the secondary channel has stopped and main channel data will resume. This alarm is only available when the service is set for DDS. It is not stored in the alarm buffer.
- **Unit Dropped** - generated by the central DAP in a multidrop network when communication is lost with a remote unit. This alarm is only available when the service is set for DDSNI.
- **Unit Added** - generated by the central DAP in a multidrop network when communication is initiated with a remote unit. This alarm is only available when the service is set for DDSNI. It is not stored in the alarm buffer.
- **Automatic Dial Backup Started** - generated by the DAP when it originates or answers a dial backup call either automatically or manually through the front panel.
- **Automatic Dial Backup Failed** - generated by the DAP when it detects an automatic dial attempt failure.
- **Dial Backup Released** - after the DAP switches data from the dial line to the dedicated line, it disconnects the call and generates this alarm. This alarm is generated only by the DAP that initiated the disconnect. The call will be disconnected automatically after the amount of time selected when the Dedicated Line Test parameter in the Dial Configuration submenu is set to DDS Up. If this parameter is not set, the call must be disconnected manually through the DAP's front panel.
- **Dial Backup Failed** - generated by the DAP if a previously established call fails. This alarm will not be generated if the call was disconnected through the DAP's front panel or by a condition selected under the Automatic Disconnect parameter in the Dial Configuration submenu. The alarm will not be generated when attempts to establish a dial backup connection fail.

ISDN Dial Backup Alarms

For units equipped with the ISDN IDBU feature, an alarm message is displayed on the LCD screen when the DAP receives a Cause Information Element from the ISDN network. The cause number is the cause value received in the Cause Information Element. The associated text is a paraphrase (edited to save space) of the CCITT Q.931 definition for that cause value. See Annex G of the Q.931 standard for the precise definition of these cause values.

The DAP does not report all the cause values defined by the Q.931 standard. The following values are reported:

ISDN Cause 1	Unassigned Number	ISDN Cause 58	Capability Unavailable
ISDN Cause 2	No Route to Transit Net	ISDN Cause 63	Service/Opt. Unavailable
ISDN Cause 6	Channel Unacceptable	ISDN Cause 65	Capability Unimplemented
ISDN Cause 18	No User Responding	ISDN Cause 66	Chan, Type Unimplemented
ISDN Cause 19	No Answer from User	ISDN Cause 69	Facility Not Implemented
ISDN Cause 21	Call Rejected	ISDN Cause 70	Restricted Info. Only
ISDN Cause 22	Number Changed	ISDN Cause 79	Serv./Opt. Unimplemented
ISDN Cause 26	Selected User Clearing	ISDN Cause 81	Invalid Reference Value
ISDN Cause 27	Destination Out of Order	ISDN Cause 82	Channel Does Not Exist
ISDN Cause 28	Invalid Number Format	ISDN Cause 83	ID Does Not Exist
ISDN Cause 29	Facility Rejected	ISDN Cause 84	Call ID In Use
ISDN Cause 34	No Circuit/Channel Avail	ISDN Cause 85	No Call Suspended
ISDN Cause 38	Network Out of Order	ISDN Cause 86	Call Has Been Cleared
ISDN Cause 41	Temporary Net Failure	ISDN Cause 88	Incompatible Destination
ISDN Cause 42	Switch Congestion	ISDN Cause 90	Direct Call Not Subscr.
ISDN Cause 43	User Info Discarded	ISDN Cause 91	Invalid Transit Net Sel.
ISDN Cause 44	Cir/Channel Not Avail	ISDN Cause 95	Invalid Message
ISDN Cause 47	Resource Unavailable	ISDN Cause 96	Info Element Missing
ISDN Cause 49	Quality Not Available	ISDN Cause 97	Message Unimplemented
ISDN Cause 50	Facility Not Subscribed	ISDN Cause 98	Message Not Permissible
ISDN Cause 51	Bearer Incompatible	ISDN Cause 99	IE Unimplemented
ISDN Cause 53	Service Op Violated	ISDN Cause 100	Invalid IE Contents
ISDN Cause 54	Incoming Calls Barred	ISDN Cause 118	Invalid Calling Number
ISDN Cause 57	Capability Unauthorized	ISDN Cause 127	Cause Unknown

The following message only appears when the Switch Type parameter is set to NI-1. It is generated when the switch cannot assign a requested channel, which could be caused by circuit or channel congestion, network congestion, or other capacity related conditions.

ISDN Status No Channel Available

The following messages are generated as a result of tests initiated via the Embedded Operating Channel (EOC) at network's request.

ISDN Net EOC Request	Operate 2B+D Loopback
ISDN Net EOC Request	Operate B1 Loopback
ISDN Net EOC Request	Operate B2 Loopback
ISDN Net EOC Request	Request Corrupt CRC
ISDN Net EOC Request	Notify of Corrupted CRC
ISDN Net EOC Request	Return to Normal

The following messages are generated when the DAP rejects an incoming call of an incompatible type. For example, calls from conventional telephones, calls from units equipped with Switched 56 IDBU when the dial mode parameter is not set to ESw56, or calls from units equipped with ISDN IDBU when the dial mode parameter is set to ESw56.

ISDN Status	Speech Call Rejected	ISDN Status	64 kbps Call Rejected
ISDN Status	3.1 kHz Call Rejected	ISDN Status	Incompat. Call Rejected
ISDN Status	56 kbps Call Rejected		

The following messages are generated when Progress Indicator Information Elements are received from the network. The progress value number is the Progress Descriptor value received in the Progress Indicator Information Element. The associated text is a paraphrase (edited to save space) of the formal definition for that value. Values from 1 through 10 are defined by CCITT standard Q.931. The other values are from the National standard and/or are network specific.

ISDN Progress 1	Not End-to-End ISDN Call	ISDN Progress 17	Treatment Applied To Call
ISDN Progress 2	Destination Is Non-ISDN	ISDN Progress 18	Call Proceeding
ISDN Progress 3	Origination Is Non-ISDN	ISDN Progress 19	Alerting At Destination
ISDN Progress 4	Call Returned To ISDN	ISDN Progress 20	Connected at Destination
ISDN Progress 8	In Band Info/Pattern	ISDN Progress 21	Dialing
ISDN Progress 10	Unit Could Not Answer	ISDN Progress 22	Disconnect
ISDN Progress 16	No Response, Reattempted		

Viewing Stored Alarms

The Excalibur Multirate DAP contains an alarm buffer that stores reported alarms. To view these alarms, follow these steps, starting from the Top Level menu:

1. Press the **1** or **2** button depending on which DAP's (local or remote) alarms you wish to view.

Note: Monitoring remote alarms is interruptive when the service is set for DDS.

T Excalibur DAP				Escape	Top
Local	Remot	Addr	Serve >		
1	2	3	4	<	>

- Press the **1** button.

<div> <div>L</div> <div>Local Mode</div> </div>				Escape	Top
Stats Cnfg Diag Dial >					
1	2	3	4	<	>

- Press the **>** button two times.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
DAP Dial Serve Digtl >					
1	2	3	4	<	>

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
<Digtl Unit Line Analg >					
1	2	3	4	<	>

- Press the button beneath **Alarm**. The screen then displays the most recently reported alarm on the top line.

<div> <div>L</div> <div>Status Mode</div> </div>				Escape	Top
<Analg Tests Alarm Drops >					
1	2	3	4	<	>

- Press the **3** button to scroll backward through the stored alarms. Press the **4** button to scroll forward.

<div> <div>L</div> <div>DDS RCV Loop Fault</div> </div>				Escape	Top
Clear ClrAl Prev Next					
1	2	3	4	<	>

- To clear the alarm currently displayed, press the **1** button. To clear all alarms in the buffer, press the **2** button.

Note: The DAP can not regenerate an alarm that is currently stored in the alarm buffer until it has been cleared from the buffer.

L DTE Change of State				Escape	Top
Clear	ClrAl	Prev	Next		
1	2	3	4	<	>

Dial Backup Procedures

The Excalibur Multirate DAP provides an optional Analog, Switched 56, or ISDN IDBU feature that enables both the primary and secondary channels to transmit data across the dial-up telephone line if the dedicated line fails. To control this feature, you must enter the Dial submenu. To do so, follow these steps starting from the top level menu:

- Press the **1** or **2** button depending on which DAP (local or remote) you wish to control.

T Excalibur DAP				Escape	Top
Local	Remot	AddrS	Serve >		
1	2	3	4	<	>

- Press the button beneath Dial. The screen then displays the Dial submenu. (SPID appears on the screen only for units equipped with the ISDN IDBU option.)

L Local Mode				Escape	Top
Stats	Conf g	Diag	Dial >		
1	2	3	4	<	>

L Dial Mode			
Call	Phon#	Test	SPID

The Dial submenu allows you to perform the following functions.

- Enter telephone numbers.
- Enter the Service Profile Identification (SPID) number for units equipped with the ISDN IDBU feature.
- Originate dial backup calls.
- Disconnect dial backup calls.
- Initiate dial line tests.

The following sections describe each of these procedures.

Entering Telephone Numbers

For both automatic and manual call origination to function properly, you must enter into memory the telephone number of the DAP you wish to call (referred to as the Target). You may enter a primary and up to four alternate telephone numbers for this DAP. The numbers can be a maximum of 32 digits long. When the DAP is set for automatic origination, only the primary number will be dialed.

In addition to the primary and alternate telephone numbers, you may also enter a temporary telephone number. Enter a temporary telephone number when you wish to place a manual call to a different site.

To enter telephone numbers into memory, follow these steps, starting from the Dial submenu:

1. Press the button beneath Phon#. The screen displays the target types.

<div style="display: flex; justify-content: space-between; align-items: center;"> L Dial Mode </div>				Escape	Top
Call	Phon#	Test	SPID		
1	2	3	4	<	>

- Press the button beneath the target type for which you wish to enter a telephone number. (To display Alternate 4 and Temporary, you must first press the > button.)

<div> <div> <div></div> <div>Choose Target Ph# Type</div> </div> <div> <div>Pri</div> <div>Alt1</div> <div>Alt2</div> <div>Alt3 ></div> </div> </div>				Escape	Top
1	2	3	4	<	>

<div> <div> <div></div> <div>Choose Target Ph# Type</div> </div> <div> <div><Alt3</div> <div>Alt4</div> <div>Temp</div> </div> </div>			
--	--	--	--

- Use the **1** and **2** buttons to enter the desired character in each space. Table 6-2 lists the different characters that you can enter in the telephone number when the unit is equipped with the Analog or ISDN IDBU. The Switched 56 IDBU uses pulse dialing only. The characters that you can enter in the telephone number are digits 0 through 9. When the DAP is connected to Sprint's Enhanced Switched 56 Service, you can also enter S (enable call progress sensing) and N (disable call progress sensing). The characters in a telephone number override any parameter setting. Use the < and > buttons to move from space to space. The flashing > arrow in the right corner of the screen indicates that there are more available spaces to the right. When you move the cursor past the 18th space, a flashing < arrow appears in the left corner.

<div> <div> <div></div> <div>Primary Ph# = E</div> </div> <div> <div>Inc</div> <div>Dec</div> <div>Accpt</div> <div>Other ></div> </div> </div>				Escape	Top
1	2	3	4	<	>

If you wish to insert a character between two entered characters or delete an entered character, follow Step 4. If you wish to copy an entered character, enter an M (without having to scroll to it), or enter a blank space, follow Step 5. If you do not wish to use any of these options, skip to Step 6.

4. Press the **4** button. You can now insert a character by pressing the **1** button, delete a character by pressing the **2** button, or delete a character and move the cursor one space to the left by pressing the **3** button. When finished, press the **4** button twice.

<div> <div> <div>L</div> <div>Primary Ph# = E</div> <div>></div> </div> <div>IncDecAccptOther</div> </div>				Escape	Top
1	2	3	4	<	>

<div> <div> <div>L</div> <div>Primary Ph# = E</div> <div>></div> </div> <div>INSDEL BCKSPOther</div> </div>			
--	--	--	--

5. Press the **4** button twice. You can now copy a character into the next space by pressing the **1** button, enter an M in a space by pressing the **2** button, or enter a blank space by pressing the **3** button. When finished, press the **4** button.

<div> <div> <div>L</div> <div>Primary Ph# = E</div> <div>></div> </div> <div>IncDecAccptOther</div> </div>				Escape	Top
1	2	3	4	<	>

<div> <div> <div>L</div> <div>Primary Ph# = E</div> <div>></div> </div> <div>Cpy->MBlankOther</div> </div>			
--	--	--	--

6. When the desired telephone number is displayed, press the **3** button to enter it into memory.

<div> <div> <div>L</div> <div>Primary Ph# = T9 163482</div> <div></div> </div> <div>IncDecAccptOther</div> </div>				Escape	Top
1	2	3	4	<	>

Table 6-2. Analog and ISDN IDBU Telephone Number Characters

Character	Function
0-9, #, *, A - D	Digits for dialing. A - D are invalid for ISDN IDBU.
T	Tone dialing for Analog IDBU. No function for ISDN IDBU.
P	Pulse dialing for Analog IDBU. Invalid for ISDN IDBU.
E	1-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
F	2-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
G	4-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
H	9-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
I	15-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
J	30-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
K	60-second intercharacter delay for Analog IDBU. Wait to dial for ISDN IDBU.
W	Wait for dial tone for Analog IDBU. No function for ISDN IDBU.
S	Enable call progress sensing for Analog IDBU. No function for ISDN IDBU.
N	Disable call progress sensing for Analog IDBU. No function for ISDN IDBU.

Notes: The characters in the phone number override any parameter settings.

For Analog IDBU, the intercharacter delay is inserted after the digit that immediately precedes it.

For ISDN IDBU, E - K can only be used as the first character in the dialing string.

Entering Service Profile Identification Number

The telephone company may provide you with one, two, or no Service Profile Identification (SPID) number(s) when you order ISDN Basic Rate service. Each SPID number can be a maximum of 20 digits long. If provided, the SPID number(s) must be entered into memory to comply with telephone company requirements.

To enter the SPID number(s), follow these steps, starting from the Dial submenu:

1. Press the button beneath SPID.

<div>L Dial Mode</div>				Escape	Top
Call	Phon#	Test	SPID		
1	2	3	4	<	>

2. Press the button beneath None if your telephone circuit has no SPID number.

<div>L Profile ID = ID 1</div>				Escape	Top
None	ID 1	ID 1 & 2			
1	2	3	4	<	>

3. Press the button beneath ID1 if you have 1B+D Service or the button beneath ID1&2 if you have 2B+D Service. To enter the number, follow the same instructions given in the previous section, "Entering Telephone Numbers."

Note: The DAP uses a single bearer channel and only uses the telephone number associated with SPID ID1.

<div>L Profile ID = None</div>				Escape	Top
None	ID 1	ID 1 & 2			
1	2	3	4	<	>

<div>L ID 1 = _ ></div>			
Inc	Dec	Accpt	Other

Originating Dial Backup Calls

Dial backup telephone calls can be originated automatically (if the Automatic Dial parameter is enabled) or manually by entering front panel commands. To initiate a dial backup call manually, follow these steps, starting from the Dial submenu:

1. Press the button beneath Call.

<div> <div>L</div> Dial Mode </div>				Escape	Top
Call	Phon#	Test	SPID		
1	2	3	4	<	>

2. Press the button beneath the stored telephone number you want the DAP to dial. The DAP then begins dialing the selected number. The screen continuously updates you on the progress of the call.

<div> <div>L</div> Make Call </div>				Escape	Top
Pri	Alt1	Alt2	Alt3 >		
1	2	3	4	<	>

<div> <div>L</div> DBU Master </div>	
Awaiting Dial Tone	

Disconnecting Dial Backup Calls

Dial backup calls can be disconnected automatically by the DAP (if the Automatic Disconnect parameter is enabled) or manually by entering a front panel command. To disconnect a call manually, press the button beneath Dscnt in the Call submenu. The DAP then disconnects the dial backup connection and returns communication to the dedicated line.

Analog Dial Line Tests

The Excalibur Multirate DAP provides five diagnostic tests that check the performance of the dial backup line when the Dial Mode parameter is set to BIS+ in the Dial Configuration submenu. Three of the tests (Dial Tone Test, End-to-End Call Test, and Self-Error Test) can be initiated only during digital line operation. They do not interrupt the DAP's data transmission during or after the test. The End-to-End Error Test and the Loop 2 Error Test can be initiated only during dial backup operation. When the Dial Mode parameter is set to 32BIS in the Dial Configuration submenu, two tests are available: Dial Tone Test and Self-Error Test.

- **Dial Tone Test** - takes the dial line off-hook and checks for a dial tone.
- **End-to-End Call Test** - establishes a dial line connection between the local and remote DAPs. The local DAP then sends a message to verify the end-to-end connection.
- **Self-Error Test** - loops the dial interface back towards the unit and a pseudo-random 2047 or 511 test pattern is transmitted, received, and checked for errors. The error count can be monitored and errors can be inserted.
- **End-to-End Error Test** - local and remote units stop passing main channel data and transmit and receive a pseudo-random 2047 or 511 test pattern. The error count from each unit can be monitored and errors can be inserted at each unit.
- **Loop 2 Error Test** - places the far-end unit into a Digital Loop or a V.54 Digital Loop depending on the Remote Digital Loop parameter setting in the DAP Configuration submenu. The local unit generates a 2047 or 511 test pattern through the looped path. The error count can be monitored and errors can be inserted at the local unit.

Notes: To select the test pattern for the Self-Error Test, End-to-End Error Test, or Loop 2 Error Test, enter the DAP Configuration submenu and press the button beneath `Pttn`. Then press the button beneath the desired test pattern.

If the Diagnostic Compatibility parameter in the RCP submenu is set to On, the DAP will generate the 511 test pattern for the End-to-End Error Test and the Loop 2 Error Test during dial backup operation regardless of the pattern selected in the DAP Configuration submenu.

To initiate the Dial Tone Test and End-to-End Call Test, follow these steps, starting from the Dial submenu:

1. Press the button beneath **Test**.

L Dial Mode				Escape	Top
Call	Phon#	Test			
1	2	3	4	<	>

2. Press the **1** button. The DAP starts the Dial Tone Test. (To end the test while it is in progress, press the **Escape** button. Then press the button beneath **Abort**.)

L Dial Test				Escape	Top
DTone	EECal				
1	2	3	4	<	>

L DTT			
Awaiting Dial Tone			

3. When the test is completed, the screen displays the results (Passed or Failed) on the bottom line. Press the **Escape** button. Then press the **2** button. The screen displays the target types.

L DTT Terminated				Escape	Top
Passed					
1	2	3	4	<	>

L DTT Passed			
DTone	EECal		

4. Press the button beneath the target type you want to establish a dial line connection with. The DAP starts the End-to-End Call Test. (To end the test while it is in progress, press the **Escape** button. Then press the button beneath Abort.)

L Choose Target Ph# Type				Escape	Top
Pri	Alt1	Alt2	Alt3 >		
1	2	3	4	<	>

L Call E-E Tst	
Dialing Target	

5. When the test is completed, the screen displays the results (Passed or Failed) on the bottom line.

L Call E-E Tst Terminate				Escape	Top
Passed					
1	2	3	4	<	>

Press the **Escape** button two times to return to the Dial submenu.

To initiate the Self-Error Test, End-to-End Error Test, and Loop 2 Error Test, follow these steps, starting from the Diagnostics submenu:

1. Press the button beneath Aggr.

L Diagnostic Mode				Escape	Top
Aggr	Port	Chnnl			
1	2	3	4	<	>

2. Press the button beneath Dial.

L Choose Type				Escape	Top
Ded Dial					
1	2	3	4	<	>

3. When the DAP is in normal operation, SlfEr (Self-Error) appears on the screen. When it is in dial backup operation, EEErr (End-to-End Error) and L2Err (Loop 2 Error) appear on the screen if the Dial Mode parameter is set to BIS+ in the Dial Configuration submenu. If the Dial Mode parameter is set to 32BIS, DLoop (Digital Loop) appears on the screen. The procedure for running both tests is identical. Press the 1 button.

L Dial Aggr Diagnostics				Escape	Top
SlfEr					
1	2	3	4	<	>

4. Press the button beneath Timed if you wish to specify the test length. Press the button beneath Cont if you wish to run the test continuously. To terminate a continuous test, press the button beneath Clear.

L Test Duration				Escape	Top
Timed Cont					
1	2	3	4	<	>

5. Use the **1**, **2**, and **<** buttons to enter the desired length of the test (1 - 999 seconds). When the desired number is displayed, press the **3** button to start the test. The screen then displays an error counter and the time remaining in the test. If you want to abort a test while it is in progress, press the **1** button. If you wish to insert an error into the test pattern, press the **2** button. (This verifies that the error detector is working properly.) To reset the error counter back to 0, press the **3** button.

L Self Err Timer = 060s				Escape	Top
Inc		Dec		Accept	
1	2	3	4	<	>

L Self Err 0, T = 59s					
Clear		Insrt		Reset	

Switched 56 Dial Line Tests

When the DAP is in Switched 56 dial backup operation, you can initiate the following tests and loops provided in the Diagnostics submenu. Chapter 7 provides descriptions and instructions for initiating these tests.

Note: When the DAP is in dial backup operation and the DTE data rate is 56 Kbps, tests and loops requiring communication with a remote unit (End-to-End Error Test, Loop 2 Test, and Loop 2 Error Test) are not provided.

- **End-to-End Error** - can be run on the entire aggregate bandwidth (Aggregate End-to-End Error Test), through an individual port (Port End-to-End Error Test), or through a channel's lowest numbered port (Channel End-to-End Error Test). During dial backup operation with a DAP equipped with ISDN IDBU, this test can only be initiated from the unit equipped with ISDN IDBU.
- **Digital Loop** - can be run through an individual port (Port Digital Loop Test), or through a channel's lowest numbered port (Channel Digital Loop Test).
- **V.54 Digital Loop** - can be run through an individual port (Port V.54 Digital Loop Test), or through a channel's lowest numbered port (Channel V.54 Digital Loop Test).
- **Loop 2** - can be run through an individual port (Port Loop 2 Test), or through a channel's lowest numbered port (Channel Loop 2 Test).
- **Loop 2 Error** - can be run through an individual port (Port Loop 2 Error Test), or through a channel's lowest numbered port (Channel Loop 2 Error Test).

The Excalibur Multirate DAP provides two diagnostic tests (Dial Tone Test and End-to-End Call Test) that can be initiated only during dedicated line operation. They do not interrupt the DAP's data transmission during or after the test. Instructions for initiating these tests are given in the previous section, "Analog Dial Line Tests."

- **Dial Tone Test** - takes the dial line off-hook and checks for a wink (dial tone).
- **End-to-End Call Test** - establishes a dial line connection between the local and remote DAPs. The local DAP then sends a message to verify the end-to-end connection. The DAP initiating the call must have a functional dedicated line path to the unit being called.

The Switched 56 IDBU performs all mandatory loop tests initiated by the Switched 56 network. Recommended loop tests are not provided.

ISDN Dial Line Tests

The Excalibur Multirate DAP provides eight diagnostic tests that check the performance of the dial backup line when the Dial Mode parameter is set to EISDN in the Dial Configuration submenu. Three of the tests (Dial Tone Test, End-to-End Call Test, and Self-Error Test) can be initiated only during digital line operation. They do not interrupt the DAP's data transmission during or after the test. The End-to-End Error Test, Digital Loop Test, V.54 Digital Loop Test, Loop 2 Test, and Loop 2 Error Test can be initiated only during dial backup operation and are provided at aggregate, channel, and port levels to facilitate running tests in mixed multiport and singleport environments. (See "Fault Isolation Strategy" in Chapter 7 for a description of the each test level.) When the Dial Mode parameter is set to ISDN in the Dial Configuration submenu, two tests are available: Dial Tone Test and Self-Error Test.

- **Dial Tone Test** - checks the line to see if it is ready to receive a call setup.
- **End-to-End Call Test** - establishes a dial line connection between the local and remote DAPs. The local DAP then sends a message to verify the end-to-end connection. This test is only available when the Dial Mode parameter is set to EISDN.
- **Self-Error Test** - loops the dial interface back towards the unit and a pseudo-random 2047 or 511 test pattern is transmitted, received, and checked for errors. The error count can be monitored and errors can be inserted.
- **End-to-End Error Test** - local and remote units stop passing main channel data and transmit and receive a pseudo-random 2047 or 511 test pattern. The error count from each unit can be monitored and errors can be inserted at each unit.
- **Digital Loop Test** - isolates the local DTE from the rest of the network. During this test, the IDBU establishes two loops. It loops its receive data from the line to its transmitter output, and its transmit data input from the DTE to its receive data output to the DTE. RTS is looped as DCD.

- **V.54 Digital Loop Test** - differs from the standard Digital Loop Test in that it creates only one loop. It loops its receive data from the line to its transmitter input.
- **Loop 2 and Loop 2 Error Tests** - Loop 2 Test places the far-end unit into a Digital Loop or a V.54 Digital Loop depending on the Remote Digital Loop parameter setting in the DAP Configuration submenu for aggregate level tests only. In the Loop 2 Error Test, the local unit generates a 2047 or 511 test pattern through the looped path. The error count can be monitored and errors can be inserted at the local unit.

Notes: To select the test pattern for the Self-Error Test, End-to-End Error Test, or Loop 2 Error Test, enter the DAP Configuration submenu and press the button beneath **Pttrn**. Then press the button beneath the desired test pattern.

If the Diagnostic Compatibility parameter in the RCP submenu is set to On, the DAP will generate the 511 test pattern for the End-to-End Error Test and the Loop 2 Error Test during dial backup operation regardless of the pattern selected in the DAP Configuration submenu.

Service loops are part of the ISDN network's diagnostic capabilities. They are used to isolate trouble conditions in the local serving loop and the customer's data communications equipment. The Excalibur Multirate DAP provides the Full Channel Loopback Test and the B-Channel Loopback Test initiated by the ISDN network. An event message is displayed on the DAP's front panel when the DAP is performing a test initiated by the ISDN network. However, the **Test LED** does not light and there is no indication in the DAP's Status submenu or on the CMS system console when these loops are active.

Activating the Tests

See the "Analog Dial Line Tests" section in this chapter for instructions on activating the Dial Tone Test and End-to-End Call Test.

To activate the Self-Error, End-to-End Error, Digital Loop, V.54 Digital Loop, Loop 2, and Loop 2 Error Tests. follow these steps starting from the Diagnostics submenu:

1. Press the button beneath **Aggr**.

Diagnostic Mode				Escape	Top
Aggr	Port	Chnnl			
1	2	3	4	<	>

- Press the button beneath Dial. The screen displays the Dial Aggregate Diagnostics submenu. (See "Individual Port Testing" and "Channel Testing" in Chapter 7 for information on the Port Diagnostics and Channel Diagnostics submenus, respectively.) When the DAP is in dial backup operation, EEErr (End-to-End Error), DLoop (Digital Loop), V54DL (V.54 Digital Loop), Loop2 (Loop 2) and L2Err (Loop 2 Error) appear on the screen. (To select the Loop 2 Error Test, you must first press the > button.) When the DAP is in normal operation SlfEr (Self-Error) appears on the screen.

<div> <div>L</div> <div>Choose Type</div> </div>				Escape	Top
<div> <div>Ded</div> <div>Dial</div> </div>					
1	2	3	4	<	>

<div> <div>L</div> <div>Dial Aggr Diagnostics</div> </div>			
<div> <div>EEErr</div> <div>DLoop</div> <div>V54DL</div> <div>Loop2</div> <div>></div> </div>			

Activating Timed Tests

To activate a timed test (Self-Error, End-to-End Error, Loop 2 Error), follow these steps, starting from the Dial Aggregate Diagnostics submenu:

Note: The End-to-End Error Test is not available when the service is set for Clear Channel 64 Kbps or when the Clear Secondary Channel feature is enabled.

- Press the button beneath the test you wish to run. (To select the Loop 2 Error Test, you must first press the > button.)

<div> <div>L</div> <div>Dial Aggr Diagnostics</div> </div>				Escape	Top
<div> <div>EEErr</div> <div>DLoop</div> <div>V54DL</div> <div>Loop2</div> <div>></div> </div>					
1	2	3	4	<	>

2. Press the button beneath **Timed** if you wish to specify the test length. Press the button beneath **Cont** if you wish to run the test continuously. To terminate a continuous test, press the button beneath **Clear**.

<div><div>L</div>Test Duration</div>				Escape	Top
<div>TimedCont</div>				<	>
1	2	3	4		

3. Use the **1**, **2**, and **<** buttons to enter the desired length of the test (1 - 999 seconds). When the desired number is displayed, press the **3** button to start the test. The screen then displays an error counter and the time remaining in the test. If you want to abort a test while it is in progress, press the **1** button. If you wish to insert an error into the test pattern, press the **2** button. (This verifies that the error detector is working properly.) To reset the error counter back to 0, press the **3** button.

<div><div>L</div>E - E Err Test Timer = 0 6 0 s</div>				Escape	Top
<div>IncDecAcpt</div>				<	>
1	2	3	4		

<div><div>L</div>E - E Err Tst 0 , T = 5 9 s</div>			
<div>ClearInsrtReset</div>			

Activating Loop Tests

To activate a Digital Loop, V.54 Digital Loop, or Loop 2 Test, follow these steps, starting from the Dial Aggregate Diagnostics submenu:

Notes: The Loop 2 Error Test is a timed loop test. Instructions for activating this test are given in the previous section, "Activating Timed Tests."

The Loop 2 and Loop 2 Error Tests are not available when the service is set for Clear Channel 64 Kbps or when the Clear Secondary Channel feature is enabled.

1. Press the button beneath the loop you wish to run.

<div> <div>L</div> <div>Dial Aggr Diagnostics</div> </div>				Escape	Top
<div> <div>EEEErr</div> <div>DLoop</div> <div>V54DL</div> <div>Loop2 ></div> </div>					
1	2	3	4	<	>

2. Press the **1** button to start the loop. The DAP then activates the loop.

<div> <div>L</div> <div>Ag:R-D Loop</div> <div>Inactive</div> </div>				Escape	Top
<div> <div>Start</div> </div>					
1	2	3	4	<	>

3. Press the **1** button when you wish to clear the Loop.

<div> <div>L</div> <div>Ag:R-D Loop</div> <div>Active</div> </div>				Escape	Top
<div> <div>Clear</div> </div>					
1	2	3	4	<	>

Sending Call Messages

The Call feature allows you to send messages to other Excalibur DAPs in the network or to the CMS network management system. This feature is not available when the service is set for CC64 and the unit is not equipped with the Analog or ISDN IDBU option or when the Clear Secondary Channel feature is enabled. When the service is set for CC64 and the unit is equipped with the Analog or ISDN IDBU option or when the service is set for DDS, the Call submenu only appears on the screen if the Controller parameter is set to No in the RCP submenu and the Location parameter is set to Central in the DAP Configuration submenu. In these instances, a call message can only be sent from the central unit to the CMS network management system. When the service is set for DDSNI or C64NI, a central or remote unit can send a call message to the NMC if the Controller parameter is set to No. If the Controller parameter is set to Yes, the call message is sent to the far-end DAP.

To send a message, you must enter one of 10 numerical codes (0 - 9) into the DAP. Each code signifies a message previously agreed upon by both DAP operators. For example, 5 can indicate that the system is going down for 5 minutes. After you enter the code, the DAP transmits it through the secondary channel to the address designated as Remote in the Address submenu. (See Chapter 4.)

To send a message, follow these steps, starting from the Top Level menu:

1. Press the **1** button.

<div> <div>T</div> <div>Excalibur DAP</div> </div>				Escape	Top
Local	Remot	Addr	Serve >		
1	2	3	4	<	>

2. Press the **>** button.

<div> <div>L</div> <div>Local Mode</div> </div>				Escape	Top
Stats	Confg	Diag	Dial >		
1	2	3	4	<	>

3. Press the button beneath **Call**.

<div> <div>L</div> <div>Local Mode</div> </div>				Escape	Top
<Dial	Call	Secur			
1	2	3	4	<	>

4. Press the **1** and **2** buttons to enter the desired digit in the space.

<div> <div>L</div> <div>Send Call # = 0</div> </div>				Escape	Top
Inc	Dec	Accpt			
1	2	3	4	<	>

5. When the desired code is displayed, press the **3** button to send it.

<div><div>L</div><div>Send Call # = <u>5</u></div></div>				Escape	Top
Inc	Dec	Accpt			
1	2	3	4	<	>

Chapter 7

Troubleshooting

Overview

Malfunctions in your communications network can range in severity from an unacceptably high error rate (more than one error per 100,000 bits) to a complete system failure (no data transfer). To eliminate costly downtime, you need to act quickly when any such malfunction occurs. The Excalibur Multirate DAP provides a full complement of built-in diagnostic tests that help you to quickly and accurately isolate the source of the problem. This chapter explains how to use these tests to effectively troubleshoot your network.

Initial Checks

When a malfunction occurs, there are several checks you should perform before you begin using the DAP's built-in diagnostic tests:

- ☐ Visually inspect each DAP. Check that the DAP is plugged in and that all cables are in good condition and connected securely.
- ☐ Verify that the AC power outlet is providing the proper amount of voltage.
- ☐ Verify that each DAP's operating parameters are set correctly. Check for any parameter changes that were made shortly before the malfunction began, as these may have triggered the problem.
- ☐ Check the current status of the DTE interface signals. (See Chapter 6 for details.) An abnormal signal status can point you towards the faulty component. For example, a constantly low RTS signal points to a terminal problem while a constantly low CTS signal points to either a network or a DAP problem.

Fault Isolation Strategy

A typical communications network consists of the following basic components: the local and remote DTEs, the local and remote DAPs, and the interconnecting DDS lines. When a malfunction occurs, the source of the problem can usually be isolated to one of these components.

To isolate the defective component, you must systematically check the entire network. The object is to eliminate components by verifying that they are operating properly. As you verify that each component is operating properly, one component eventually stands out as the source of the problem.

The Excalibur Multirate DAP's diagnostic tests are designed so that you can isolate and verify the different components in the network. Three levels of tests are provided to facilitate running tests in mixed multiport and singleport environments:

- **Aggregate Level** - uses the total available aggregate bandwidth for testing all ports. When using Rate Adaption in the DDSNI mode, the port clock speed will increase.
- **Channel Level** - tests the lowest numbered port assigned to the channel. Channel level tests are available only when the service is set for DDSNI and the Multiport Framing parameter is enabled.
- **Port Level** - allows any active port assigned to a channel to be tested.

Notes: If you are performing tests with Multiport or Multirate DAPs equipped with software revision number SSC0778 or lower, be sure the Diagnostic Compatibility parameter in the RCP submenu is set to On.

When running tests in mixed multiport and singleport networks, care should be taken in addressing the far-end singleport unit when performing any test at the port level.

When a test is either activated or cleared on a port in a shared group (multiport unit), data is momentarily interrupted on all other ports in the unit.

The following sections describe the functions of each of the Excalibur Multirate DAP's diagnostic tests.

Self-Error Test

The Self-Error Test checks the DAP's internal circuitry for faults. Perform this test at the start of the fault isolation process to eliminate the DAP as the source of the problem.

When the Self-Error Test is activated, the DAP loops its transmitter to its receiver and circulates a test pattern through the looped path. (See Figure 7-1.) A test pattern comparator checks the pattern for errors. The Excalibur Multirate DAP lets you program how long (1 - 999 seconds or continuous) you wish this test to run. The recommended length is 60 seconds. If any errors occur during this test, perform a Local-Error Test.

Notes: When the Self-Error Test is active, the DAP will not respond to Non-Latching Loopback requests from the Telco.

Do not insert or remove the dedicated line when this test is active. Doing so will cause errors in the test pattern and terminate the test.

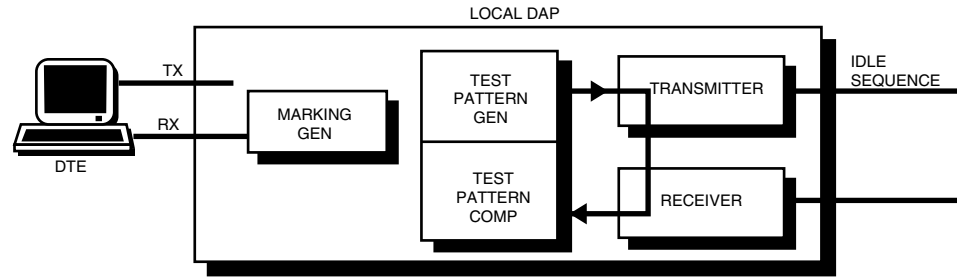


Figure 7-1. Self-Error Test

Local-Error Test

The Local-Error Test checks the interface circuitry for faults. To perform the test, you must disconnect the cable connected to the 8-pin modular jack labeled **DED** on the DAP's rear panel and replace it with a looping cable. To make this connection, connect cable connector Pin 8 (Receive Ring) to DAP connector Pin 1 (Transmit Ring) and cable connector Pin 7 (Receive Tip) to DAP connector Pin 2 (Transmit Tip). This cable is not supplied by Milgo.

The Local-Error Test can only be activated manually through the DAP's front panel. It can not be activated from CMS.

When this test is activated, the DAP generates a test pattern through the DDS interface which is looped back via the looping cable. (See Figure 7-2.) A test pattern comparator checks the pattern for errors. During the test, the DAP's clocking is automatically set to internal. The Excalibur Multirate DAP lets you program how long (1 - 999 seconds or continuous) you wish this test to run. The recommended length is 60 seconds. Errors occurring during this test generally indicate that the problem lies with the interface circuitry.

Note: The Local-Error Test is a full bandwidth test.

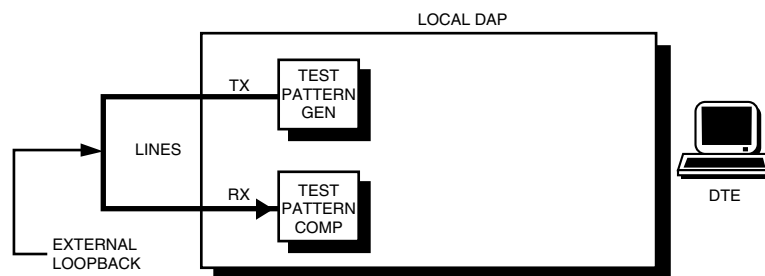


Figure 7-2. Local-Error Test (Interface Circuitry)

The Local-Error Test can also be used to check the customer's lines. (See Figure 7-3.) When this test is activated, the DAP sends its transmitter output through the customer's lines. The output is looped back via the looping cable.

Note: This test is effective provided the receive level loss is -20 dB or less. A receive level loss of -21 dB or greater on the line will cause errors in the test pattern.

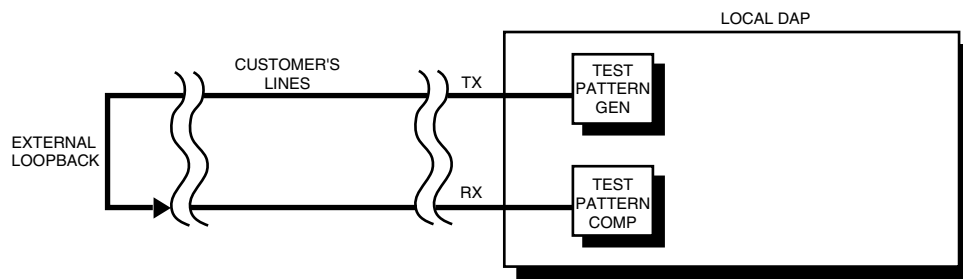


Figure 7-3. Local-Error Test (Customer's Lines)

End-to-End Error Test

You can verify the operation of the DDS lines by running an End-to-End Error Test. (See Figure 7-4.) You can run this test on the entire aggregate bandwidth (Aggregate End-to-End Error Test), through an individual port (Port End-to-End Error Test), or through a channel's lowest numbered port (Channel End-to-End Error Test). This test should not be activated from the RCP. The test is not available in Clear Channel 64 Kbps mode or when the Clear Secondary Channel feature is enabled.

Note: The Aggregate End-to-End Error Test is not available when the Diagnostic Compatibility parameter in the RCP submenu is set to On. These tests are available at the port or channel level.

During this test, the local and remote DAPs both send a test pattern across the DDS lines. The test pattern comparators at both DAPs check the received pattern for errors. The Excalibur Multirate DAP lets you program how long (1 - 999 seconds or continuous) you wish this test to run. The recommended length is 60 seconds. Errors occurring during this test generally indicate that the problem lies with the DDS lines.

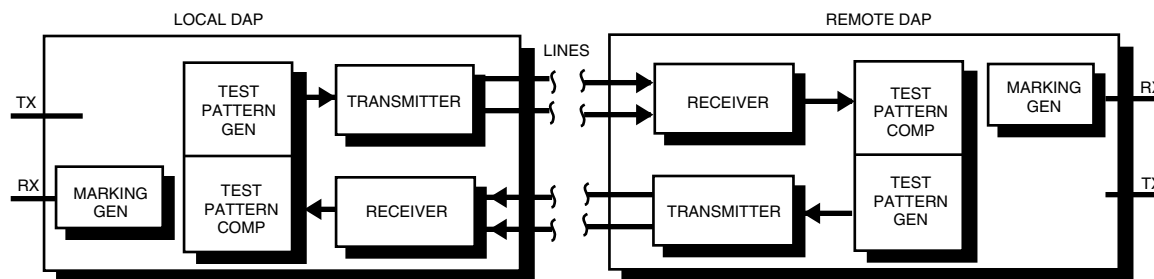


Figure 7-4. End-to-End Error Test

Network-Error Test

You can verify operation of the DDS lines by running a Network-Error Test. The Network-Error Test must be activated jointly through the DAP's front panel and the Telco's Test Set. You may substitute the Telco's equipment with your BERT test equipment at the remote DAP, or you may substitute the test equipment by initiating the test from the remote unit. This test can not be activated from CMS and should not be activated from the RCP.

During this test, the DAP generates a test pattern through the DDS interface into the network. (See Figure 7-5.) The DAP monitors for an incoming test pattern and reports any errors. The Excalibur Multirate DAP lets you program how long (1 - 999 seconds or continuous) you wish this test to run. The recommended length is 60 seconds. Errors occurring during this test generally indicate that the problem lies with the DDS lines.

Note: The Network-Error Test is a full bandwidth test.

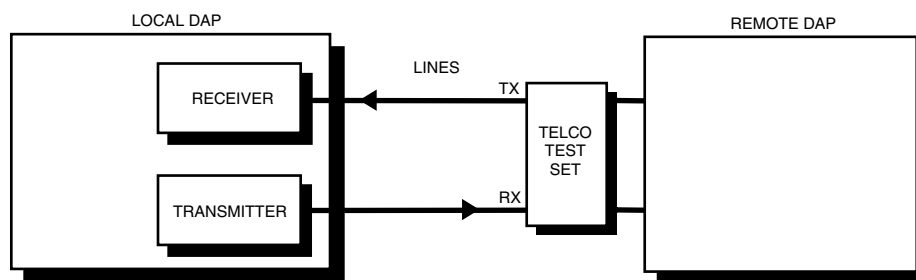


Figure 7-5. Network-Error Test

DDS Loop Test

The DDS Loop Test isolates the local DTE from the rest of the network. The DAP loops its transmitter output to its receiver input at the DTE interface, and its receive DDS data input to its transmit DDS data. (See Figure 7-6.)

Notes: The DDS Loop Test is not a full bandwidth test.

The units must be frame locked (aligned) to activate this loop in DDSNI and C64NI modes. If the units are not frame locked, the screen displays the message `Error Communication Failure`.

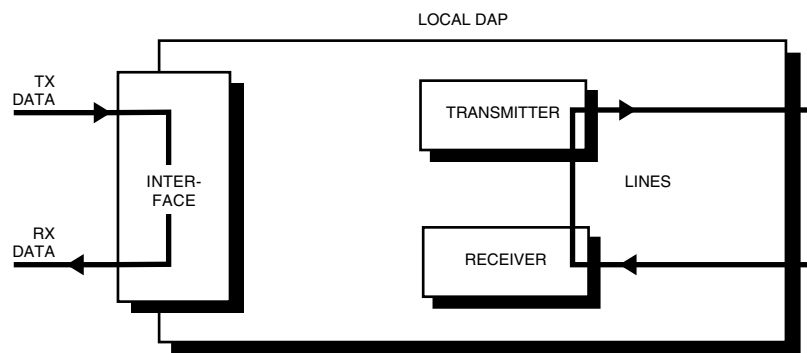


Figure 7-6. DDS Loop Test

Digital Loop Test

The Digital Loop Test isolates the local DTE from the rest of the network. You can run this test on the entire aggregate bandwidth (Aggregate Digital Loop Test), through an individual port (Port Digital Loop Test), or through a channel's lowest numbered port (Channel Digital Loop Test).

During this test, the DAP establishes two loops. It loops its receiver output to its transmitter input, and its transmit data input from the DTE to its receive data output to the DTE. (See Figure 7-7.)

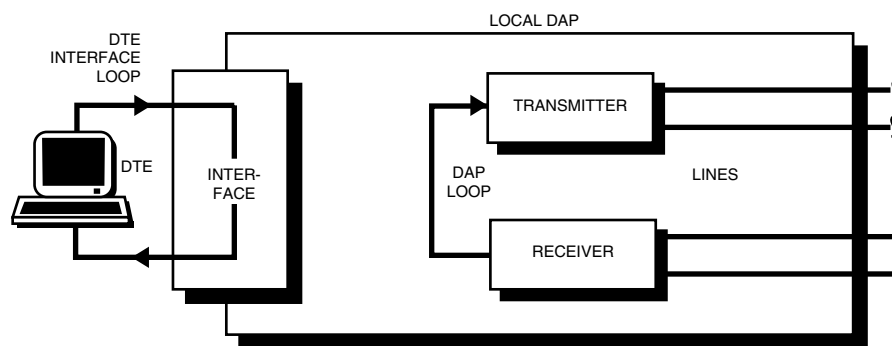


Figure 7-7. Digital Loop Test

V.54 Digital Loop Test

The V.54 Digital Loop Test differs from the standard Digital Loop Test in that it creates only one loop. It loops its receiver output to its transmitter input. It electronically disconnects the DAP from the DTE. (See Figure 7-8.) You can run this test on the entire aggregate bandwidth (Aggregate Digital Loop Test), through an individual port (Port Digital Loop Test), or through a channel's lowest numbered port (Channel Digital Loop Test).

When the service is set for DDS, this test may also be used to place a remote DAP into a V.54 Digital Loop. To do so, initiate the test from the RCP. After the test is initiated, press the **Top** button. Control is then returned to the local unit and the remote unit is placed into a V.54 Digital Loop.

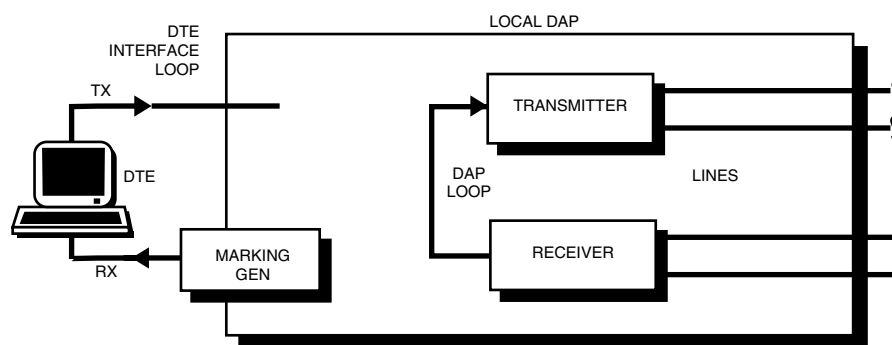


Figure 7-8. V.54 Digital Loop Test

Loop 2 and Loop 2 Error Tests

The Loop 2 Test places the far-end DAP into a V.54 Digital Loop. (See Figure 7-9.) You can run this test on the entire aggregate bandwidth (Aggregate Digital Loop Test), through an individual port (Port Digital Loop Test), or through a channel's lowest numbered port (Channel Digital Loop Test). This test allows you to isolate the far-end DTE from the rest of the network. If you want the DAP to generate a test pattern through the looped path, you can select a Loop 2 Error Test. (See Figure 7-10.) The DAP lets you program how long (1 - 999 seconds or continuous) you wish the Loop 2 Error Test to run. The recommended length is 60 seconds. These tests should not be activated from the RCP. The Loop 2 and Loop 2 Error Test are not available when the service is set for Clear Channel 64 Kbps or when the Clear Secondary Channel feature is enabled.

Notes: The Aggregate Loop 2 and Aggregate Loop 2 Error Tests are not available when the Diagnostic Compatibility parameter in the RCP submenu is set to On. These tests are available at the port or channel level.

The far-end DAP will be placed in a Digital Loop or a V.54 Digital Loop depending on its Remote Digital Loop Parameter setting in the DAP Configuration submenu for Aggregate level tests only.

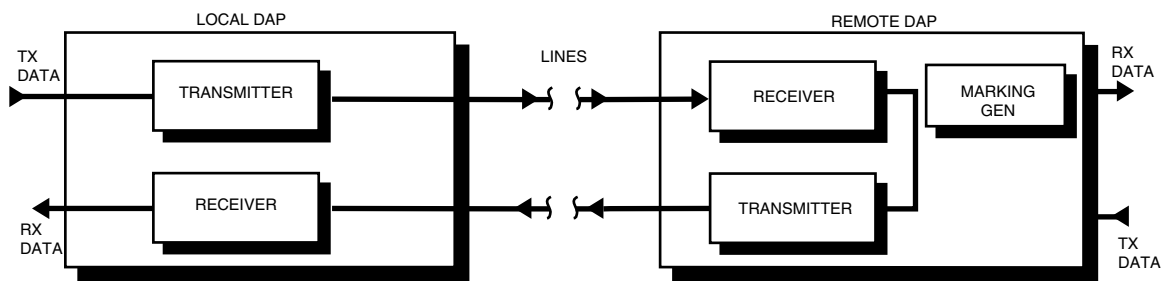


Figure 7-9. Loop 2 Test

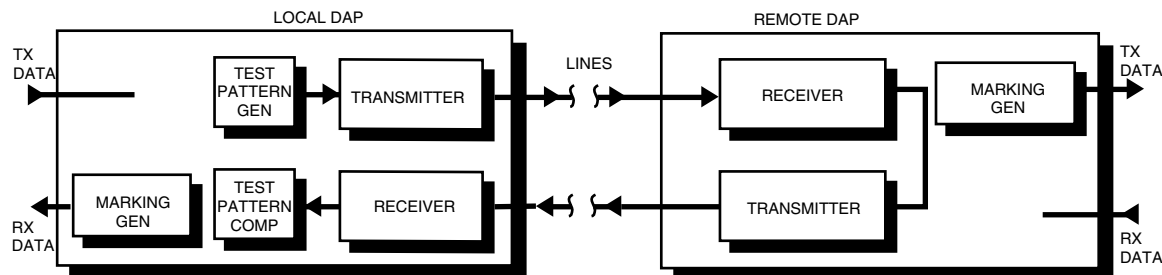


Figure 7-10. Loop 2 Error Test

Service Loops

Service loops are part of the DDS network's diagnostic capabilities. They are used to isolate trouble conditions in the local serving loop and the customer's data communications equipment. The service loops provided by the Excalibur Multirate DAP are described in the following sections. Refer to AT&T Publication 62310 for more complete information.

CSU Loopback Test

The CSU Loopback Test is a mandatory network loopback test enabled by a reversal of the local cable simplex polarity. The DDS line receive data is looped to DDS line transmit data. At the DTE interfaces, DCD is off and receive data is clamped to a Mark. (See Figure 7-11.)

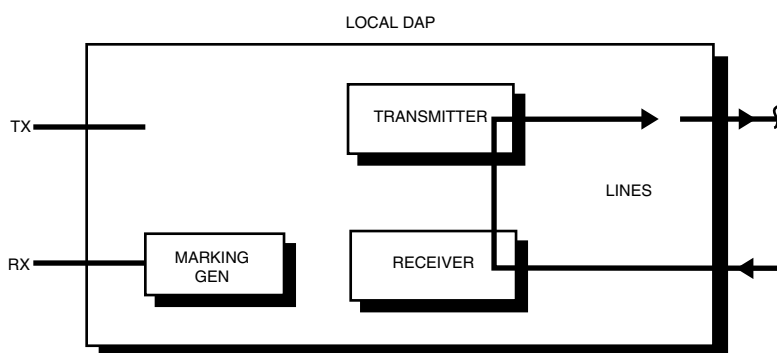


Figure 7-11. CSU Loopback Test

Non-Latching Loopback Test

The Non-Latching Loopback Test is an optional network loopback test. This test is enabled by the reception of a minimum of four specific loopback codes. It is maintained as long as every other byte contains a loopback code, until five successive bytes are received without the loopback indication. This test is operational in DDS and DDSNI modes. It is operational in DDS-SC mode only when the line rate is 56 Kbps. In DDS mode, DDS line receive data is looped to DDS line transmit data. In DDS-SC mode, line receive data is also looped to line transmit data, except that certain code bytes are mapped to produce specific return bytes as specified by AT&T Publication 62310. At the DTE interfaces in both modes of operation, DCD is off and receive data is clamped to a Mark. (See Figure 7-12.) CSU, DSU, and OCU loopbacks are supported.

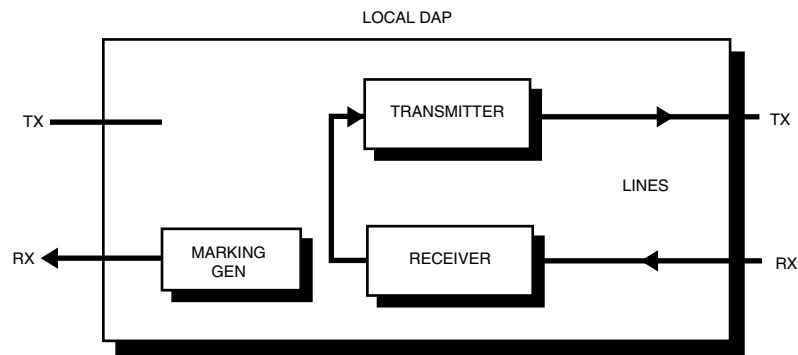


Figure 7-12. Non-Latching and Latching Loopback Tests

Latching Loopback Test

The Latching Loopback Test is an optional network loopback test initiated by the reception of a complex sequence of code bytes as defined by AT&T Publication 62310. It is operational in DDS-SC and Clear Channel 64 Kbps modes. This loopback test uses the same signal routing as called for by the Non-Latching Loopback Test, except that the mapping of some return bytes is different. (Refer to AT&T Publication 62310 for this mapping.) The Latching Loopback Test may be enabled or disabled from the front panel. (See Figure 7-12.)

Activating the Tests

To activate any of the Excalibur Multirate DAP tests, you must enter the Diagnostics submenu. To do so, follow these steps, starting from the Top Level menu:

- 1. Press the 1 or 2 button depending on which DAP (local or remote) you wish to test.

T Excalibur DAP				Escape	Top
Local	Remot	Addr s	Serve >		
	2		4		

- Press the button beneath Diag. The screen then displays the Diagnostic Mode submenu.

Local Mode				Escape	Top
Stats	Conf g	Diag	Dial >		
	2		4		

- Press the 1 button. (See "Individual Port Testing" on page 7-14 for information on the Port Diagnostics submenu and see "Channel Testing" on page 7-15 for information on the Channel Diagnostics submenu.)

Diagnostic Mode				Escape	Top
Aggr	Port	Chnnl			
	2		4		

If the unit is equipped with the Analog or ISDN IDBU feature, follow Step 4. Otherwise, follow Step 5.

- Press the button beneath Ded. (See "Analog Dial Line Tests" and "ISDN Dial Line Tests" in Chapter 6 for information on Dial diagnostics.) The screen then displays the Dedicated Aggregate Diagnostics submenu. (To select the V.54 Digital Loop Test, Loop 2 Test, or Loop 2 Error Test, you must first press the > button. Press the > button again to select the Local-Error Test or Network-Error Test.)

Choose Type				Escape	Top
Ded	Dial				
	2		4		

Ded Aggr Diagnostics			
SIfEr	EEErr	DDS	DLoop >

5. The screen displays the Aggregate Diagnostics submenu. (To select the V.54 Digital Loop Test, Loop 2 Test, or Loop 2 Error Test, you must first press the > button. Press the > button again to select the Local-Error Test or Network-Error Test.)

Aggregate Diagnostics				Escape	Top
SlfEr	EEErr	DDs	DLoop >		
	2		4		

Notes: The End-to-End Error Test, Loop 2 Test, and Loop 2 Error Test are not available when the Diagnostic Compatibility parameter in the RCP submenu is set to On. These tests are available at the port or channel level.

When you perform a diagnostic test between two DAPs, activate and clear the test from the same unit. If you make a mistake, use the Return to Normal (RTN) function (described on page 7-16) to return the unit to a normal operating mode.

Activating Timed Tests

To activate a timed test (Self-Error, End-to-End Error, Loop 2 Error, Local-Error, or Network-Error), follow these steps, starting from the Aggregate Diagnostics submenu:

Note: The End-to-End Error Test is not available when the service is set for Clear Channel 64 Kbps or when the Clear Secondary Channel feature is enabled.

1. Press the button beneath the test you wish to run. (To select the Loop 2 Error Test, you must first press the > button. Press the > button again to select the Local-Error Test or Network-Error Test.)

Aggregate Diagnostics				Escape	Top
SlfEr	EEErr	DDs	DLoop >		
	2		4		

- Press the button beneath **Timed** if you wish to specify the test length. Press the button beneath **Cont** if you wish to run the test continuously. To terminate a continuous test, press the button beneath **Clear**.

<div> <div>L</div> <div>Test Duration</div> </div>				Escape	Top
<div> <div>Timed</div> <div>Cont</div> </div>					
	2		4		

- Use the **1**, **2**, and **<** buttons to enter the desired length of the test (1 - 999 seconds). When the desired number is displayed, press the **3** button to start the test. The screen then displays an error counter and the time remaining in the test. If you want to abort a test while it is in progress, press the **1** button. If you wish to insert an error into the test pattern, press the **2** button. (This verifies that the error detector is working properly.) To reset the error counter back to 0, press the **3** button.

<div> <div>L</div> <div>Self Err Timer=060s</div> </div>				Escape	Top
<div> <div>Inc</div> <div>Dec</div> <div>Accpt</div> </div>					
	2		4		

<div> <div>L</div> <div>Self Err 0, T=59s</div> </div>			
<div> <div>Clear</div> <div>Insrt</div> <div>Reset</div> </div>			

Activating Loop Tests

To activate a DDS, Digital Loop, V.54 Digital Loop, or Loop 2 Test, follow these steps, starting from the Aggregate Diagnostics submenu:

Notes: The Loop 2 Error Test is a timed loop test. Instructions for activating this test are given in the previous section, "Activating Timed Tests."

The Loop 2 and Loop 2 Error Tests are not available when the service is set for Clear Channel 64 Kbps or when the Clear Secondary Channel feature is enabled.

1. Press the button beneath the loop you wish to run. (To select a V.54 Digital Loop Test or Loop 2 Test, you must first press the > button.)

Aggregate Diagnostics				Escape	Top
SlfEr	EEErr	DDS	DLoop >		
	2		4		

2. Press the 1 button to start the loop. The DAP then activates the loop.

Ag:DDS Loop Inactive				Escape	Top
Start					
1	2	3	4	<	>

3. Press the 1 button when you wish to clear the Loop.

Ag:DDS Loop Active				Escape	Top
Clear					
1	2	3	4	<	>

Individual Port Testing

The following tests can be run through an individual port: End-to-End Error, Digital Loop, V.54 Digital Loop, Loop 2, and Loop 2 Error. To run a test through an individual port, follow these steps, starting from the Diagnostics Mode submenu:

Note: The End-to-End Error, Loop 2, and Loop 2 Error Tests are not available when the service is set for Clear Channel 64 Kbps or when the Clear Secondary Channel feature is enabled.

1. Press the **2** button. The screen displays the names of the tests you can run. (To select the Loop 2 Error Test, you must first press the **>** button.)

<div> <div>L</div> <div>Diagnostic Mode</div> </div>				Escape	Top
Aggr	Port	Chnnl			
1	2	3	4	<	>

<div> <div>L</div> <div>Port- Diagnostics</div> </div>			
EEErr	DLoop	V5 DL	Loop >

2. If you are running an End-to-End Error Test, Loop 2 Test, or Loop 2 Error Test, the screen displays the first four remote ports on the bottom line. If you are running a test with another Excalibur Multirate DAP, you must select Port 1. If you are running a test with an Excalibur Multiport DAP, you must select the corresponding port on the remote unit. Press the button beneath the remote port you wish to test. (To select Port 5 or 6, you must first press the **>** button.)

<div> <div>L</div> <div>Select remote port</div> </div>				Escape	Top
P	P	P	P	>	
1	2	3	4	<	>

Notes: When running tests in mixed multiport and singleport networks, care should be taken in addressing the far-end singleport unit when performing any test at the port level.

When a test is either activated or cleared on a port in a shared group (multiport unit), data is momentarily interrupted on all other ports in the unit.

You can now run a test through the selected port by following the same instructions previously given in the "Activating Timed Tests" and "Activating Loop Tests" sections.

Channel Testing

Channel level tests are available only when the service is set for DDSNI and the Multiport Framing parameter is enabled. The lowest numbered port in the selected channel is tested. The following tests can be run through a channel: End-to-End Error, Digital Loop, V.54 Digital Loop, Loop 2, and Loop 2 Error. To run a test through a channel, follow these steps, starting from the Diagnostics Mode submenu:

1. Press the **3** button.

L Diagnostic Mode				Escape	Top
A g g r		P o r t		C h n l	
1	2	3	4	<	>

2. The top line of the screen displays the port's current channel assignment selected under the Channel Assignment parameter in the Channel Configuration submenu. The bottom line of the screen displays the names of the tests you can run. (To select the Loop 2 Error Test, you must first press the > button.)

L C Diagnostics				Escape	Top
E E Err		D Loop		V 5 DL	Loop >
1	2	3	4	<	>

You can now run a test through the selected channel by following the same instructions previously given in the "Activating Timed Tests" and "Activating Loop Tests" sections.

RTN Function

The RTN (Return to Normal) function allows you to return the local or remote unit to a normal operating mode from a testing mode, clear alarms, and turn off the **User LED** when it is lit. If the unit is equipped with an IDBU option, it also allows you to reset the Automatic Backup Retries function. To do so, follow these steps, starting from the Top Level menu:

1. Press the **3** button.

Note: Sending a RTN to a remote unit is interruptive when the service is set for DDS.

T Excalibur DAP				Escape	Top
< S e r v e		F P T s t		R T N	
1	2	3	4	<	>

- Press **1** or **2** button depending on which unit (local or remote) you wish to return to normal mode. The DAP then aborts any tests in progress at the selected DAP, clears any alarms, and turns off the **User LED** if it is lit. If the unit is equipped with an IDBU option, it also resets the Automatic Dial Backup Retries function.

<div> <div>L</div> <div>Which Unit to RTN?</div> </div>				Escape	Top
<div> <div>Local</div> <div>Remot</div> </div>					
1	2	3	4	<	>

Isolating Network Problems

When used in conjunction with DAP diagnostic functions, the CMS network management system's Line Quality Statistics (LQS) displays aid in isolating network problems as described in Table 7-1. DAP diagnostics provide built-in error rate tests that can be initiated from the DAP's front panel or the CMS system console. DAP diagnostics can isolate problems to a circuit leg or unit.

Table 7-1. LQS Troubleshooting Reference Chart

Statistic	Change in Value Cause(s)	Recommendations
Percentage of time signal level is up.	Dedicated line transmit levels, receive levels, and signal quality are not within their respective predefined thresholds.	Check DAP's Transmit Calibrate level on units equipped with the Model A or C Aggregate card. Check for open or bad connections to local loop. Check if problem is with signal quality. Check other LQS parameters to isolate source of problem.
Percentage of time DDS circuit is available for use.	One or more of the following conditions are occurring: receiving Out of Service codes, receiving Abnormal Station codes (DDS-SC mode only), line is not connected to unit, receiving invalid local loop framing from network (DDS-SC mode only), receiving unknown control codes from network, performing a network service loop.	Check other LQS parameters to isolate source of problem. Check level of service from carrier.

Table 7-1. LQS Troubleshooting Reference Chart (Continued)

Statistic	Change in Value Cause(s)	Recommendations
Percentage of time DAP is receiving a valid signal from the network.	One or more of the following conditions are occurring: line is not connected to unit, receiving invalid local loop framing from network (DDS-SC mode only), receiving unknown control codes from network,	Check for open or bad connections to local loop. Check other LQS parameters to isolate source of problem.
Number of Out of Service codes received.	Receiving Out of Service codes from network.	Check with carrier for network outages. Remote unit may be disconnected from network (DDS or DDSNI point-to-point networks only). Check remote unit for power. Check for open or bad connections to local loop at remote unit. Check clocking at remote unit.
Number of Abnormal Station codes received.	Receiving Abnormal Station codes from network (DDS-SC mode only).	Check with carrier for network outages. Remote unit may be disconnected from network (DDS or DDSNI point-to-point networks only). Check remote unit for power. Check for open or bad connections to local loop at remote unit. Check clocking at remote unit.
Number of network framing errors received.	Receiving network framing errors (DDS-SC mode only), Errors occurring in local loop.	Check receive level. If receive level is OK, have local loop tested by carrier.
Number of unknown control codes received.	Receiving unknown control codes or unknown bipolar violations from the network.	Have local loop tested by carrier.
Total number of multiport/multidrop resynchronizations.	A timing slip or lengthy line disruption occurred on the DDS circuit.	Some errors normally occur. Look for repeating peaks in value. Investigate activities at remote sites during peaks.
Number of seconds receive line fault conditions occur.	Dedicated line is not connected to unit. Open in local loop.	Check for open or bad connections to local loop.
Number of seconds active network service loops occur.	Either latching or non-latching loops occurred on unit.	If testing is unsolicited or interfering with network availability, inform Telco.

Table 7-1. LQS Troubleshooting Reference Chart (Continued)

Statistic	Change in Value Cause(s)	Recommendations
Number of multiport/multidrop resynchronizations for each drop.	A timing slip or lengthy line disruption occurred on the DDS circuit.	Investigate drops that have abnormally high counts compared to other drops. Run DAP diagnostic tests to isolate circuit.
Number of times the central DAP has resynchronized the entire network (global resync count).	A timing slip or a lengthy line disruption occurred on the DDS circuit, most likely on the "control" leg of the multidrop circuit.	Investigate drops that have abnormally high counts compared to other drops. Run DAP diagnostic tests to isolate circuit. If problem is not found, run DAP diagnostic tests on the "control" leg.

Appendix A

Technical Specifications

Standalone Dimensions

Height	3.0 inches (7.6 cm)
Width	8.0 inches (20.3 cm)
Depth	12.0 inches (30.5 cm)
Weight	3.5 pounds (1.58 kg)

General

DTE Interface	EIA RS-232-E, optional CCITT V.35
Channel Interface	8-position modular jack RJ-48S, AT&T standard
CMS Interface	10-position modular jack (T7)
DTE Rates	Synchronous: 1.2 to 52.8 Kbps in multiples of 1200 bps (except 3.6 and 6 Kbps are not provided) and 56, 57.6, and 64 Kbps Asynchronous: 75, 150, 300, 600, 1200 bps and 1.2, 2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2, 24, 28.8, 48, and 57.6 Kbps
Line Requirements	Operates over all Digital Data Type 1 services, Digital Data with SC services, and ASDS; can also operate over customer owned copper wire.
Network Configurations	Point-to-point, multipoint
Clocking	Internal, external, and slave
Receiver Sensitivity	0 to -40 dB loop loss minimum up to -45 dB dependent on the service

Operating Range

Line Rate (Kbps)	Wire Gauge	Distance* (feet)	dB
72	19	60k	-45
72	26	17k	-45
56	19	64k	-45
56	26	18k	-45
19.2	19	71k	-40
19.2	26	25k	-40
9.6	19	87k	-40
9.6	26	34k	-40
4.8	19	114k	-40
4.8	26	47k	-40
2.4	19	154k	-40
2.4	26	66k	-40

* Distance meets AT&T Publication 62310 impairment requirements.

Environmental

Ambient Temperature	32°F to 122°F (0°C to 50°C)
Relative Humidity	10% to 95% ($\pm 5\%$) noncondensing
Storage Temperature	-40°F to 158°F (-40°C to 70°C)

Power

Standalone Power Requirements	92-127 VAC, 47-63 Hz
Power Consumption	22 Watts maximum
Power Dissipation	75 BTUs per hour
Aggregate Board MTBF	52,000 hours

Analog IDBU Option

Output Level	Programmable: 0 dBm to -12 dBm
	Permissive: -9 dBm
Ringer Equivalence	1.1 B
Operating Range	0 dBm to -42 dBm
Carrier Frequency	V.32 bis: 1800 Hz
	BIS+: 1866.75 Hz
Baud Rate	V.32 bis: 2400 Hz
	BIS+: 2488.8 Hz

Appendix B

ISDN Service Ordering Checklist

For Excalibur Multirate DAP ISDN IDBU applications, the following checklist can be used as an aid in ordering ISDN Basic Rate service from your local telephone company.

☐ Request an ISDN Basic Rate Interface (BRI) Line.

- U-interface reference point
- 2B1Q line coding

☐ Choose one of the following.

- 1B+D Service (Recommended selection)
- 2B+D Service (The DAP will only utilize 1B.)

☐ The ISDN IDBU supports the following switch types and software protocols.

- **AT&T 5ESS** - Custom, 5E6, and later software
- **DMS 100** - Functional Pvc0 software
- **National ISDN-1**

☐ Request that the ISDN line allocate one **DYNAMIC** Terminal Endpoint Identifier (TEI).

☐ For service offered from an AT&T 5ESS, request a point-to-point line with the following features.

B1 Service: On Demand (DMD)
Data Line Class: Point-to-Point (PP)
Maximum B Channels: 1
Circuit Switched Data (CSD) on the
 B Channel
No Packet Switched Data
Number of CSD calls: 1
Terminal Type: Type A

- ☐ For service offered from an AT&T 5ESS, turn the following features Off.

Packet Mode Data	Intercom Groups
Multiline Hunt	Network Resource Selector
Multiple Call Appearances	(Modem Pools)
Electronic Key Telephone Sets (EKTS)	Message Writing
Shared Directory Numbers	Hunting
Accept <i>Special</i> Type of Number	InterLata Competition

- ☐ For service offered from a Northern Telecom DMS-100, request a 1B+D line with the following features.

Line Type:.....Basic Rate, Functional
Protocol Level.....Functional Pvc0
Electronic Key Telephone Sets (EKTS):No
Call Appearance Handling (CACH):.....No
Non-Initializing Terminal:No
Circuit Switched Service:Yes
Packet Switched Service:.....No
TEI:Dynamic
Bearer Service:.....Circuit Switched Data
No Packet Mode Data

- ☐ Identify your long distance carrier of choice and request circuit switched 64 Kbps Clear Channel access if possible.
- ☐ Ensure that the telephone company provides you with the following information for configuring the ISDN IDBU.
 - ISDN Switch Type
 - ISDN Switch Protocol Version
 - ISDN Phone Number
 - Service Profile Identification (SPID) number with Terminal ID (TID)

Appendix C

Quick Reference Menu Flowchart

Introduction

The following Quick Reference Menu Flowchart shows you how the Excalibur Multirate DAP's front panel LCD screens are arranged in each level of the menu tree. It is designed to let you quickly locate and move to the screen you need. To move down through the flowchart, press the front panel button (**1 - 4**) beneath the desired option. To move up through the flowchart, press the **Escape** button. To return immediately to the top of the flowchart, press the **Top** button. This flowchart is not intended to be a complete representation of all text which could be displayed.

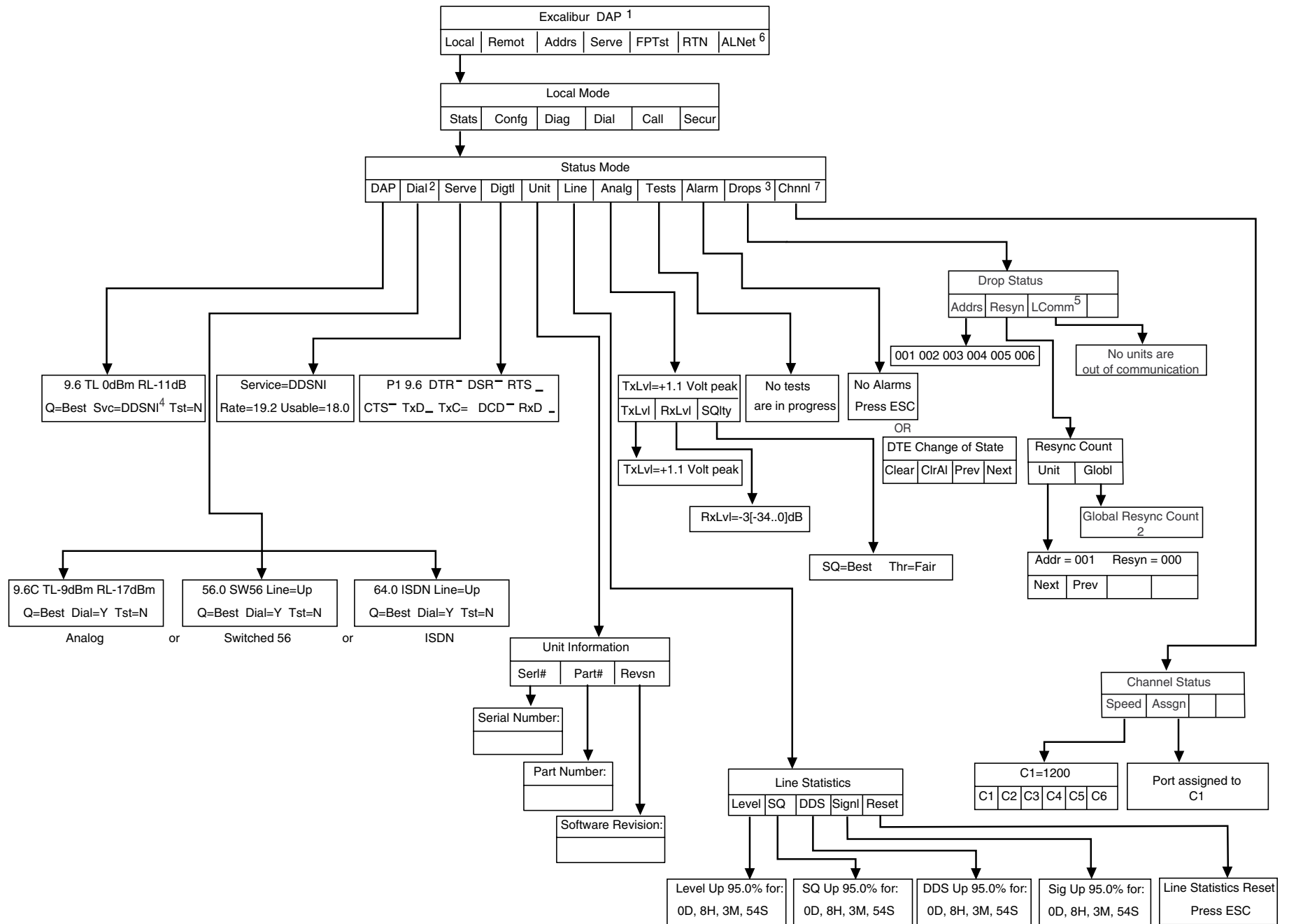
Contents

Status	C-3
Configuration	
DAP	C-5
Alias, RCP, and Port Rate	C-9
Analog Integral Dial Backup Option	C-11
Switched 56 Integral Dial Backup Option	C-13
ISDN Integral Dial Backup Option	C-15
Line Parameter Threshold, Channel Assignment, User, and System	C-17
Diagnostics	C-19
Dial, Call, and Security	C-21
Address, Service, RTN, and ALNet	C-23

Status Notes

1. The top line of the Top Level Menu displays `Excalibur DAP` for units without dial backup, `DAP +4W 56K DBU` for units equipped with the Switched 56 IDBU option, `DAP + 2 wire 14.4K DBU` for units equipped with the Analog IDBU option, or `DAP + ISDN DBU` for units equipped with the ISDN IDBU option.
2. This parameter appears on the screen only for units equipped with the Analog, Switched 56, or ISDN IDBU option.
3. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, and the Network parameter is set to multipoint in the DAP Configuration submenu.
4. When the unit is equipped with the Analog, Switched 56, or ISDN IDBU option, the screen displays `Dial=Y` or `Dial=N` in place of `Svc=DDSNI`.
5. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to disabled.
6. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to enabled.
7. This parameter appears on the screen only when the service is set for DDSNI and the Multiport Framing parameter is set to enabled.

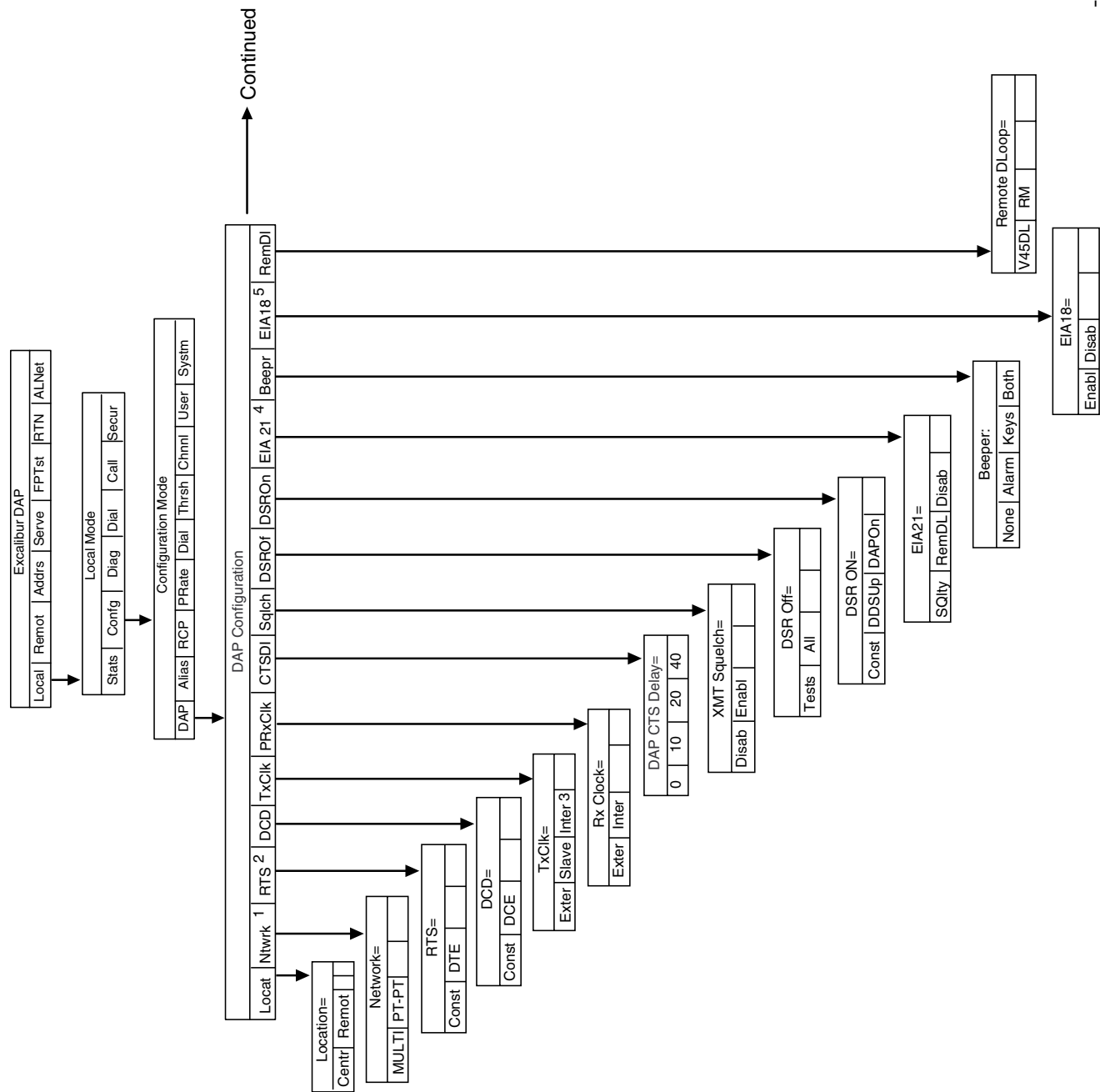
Status



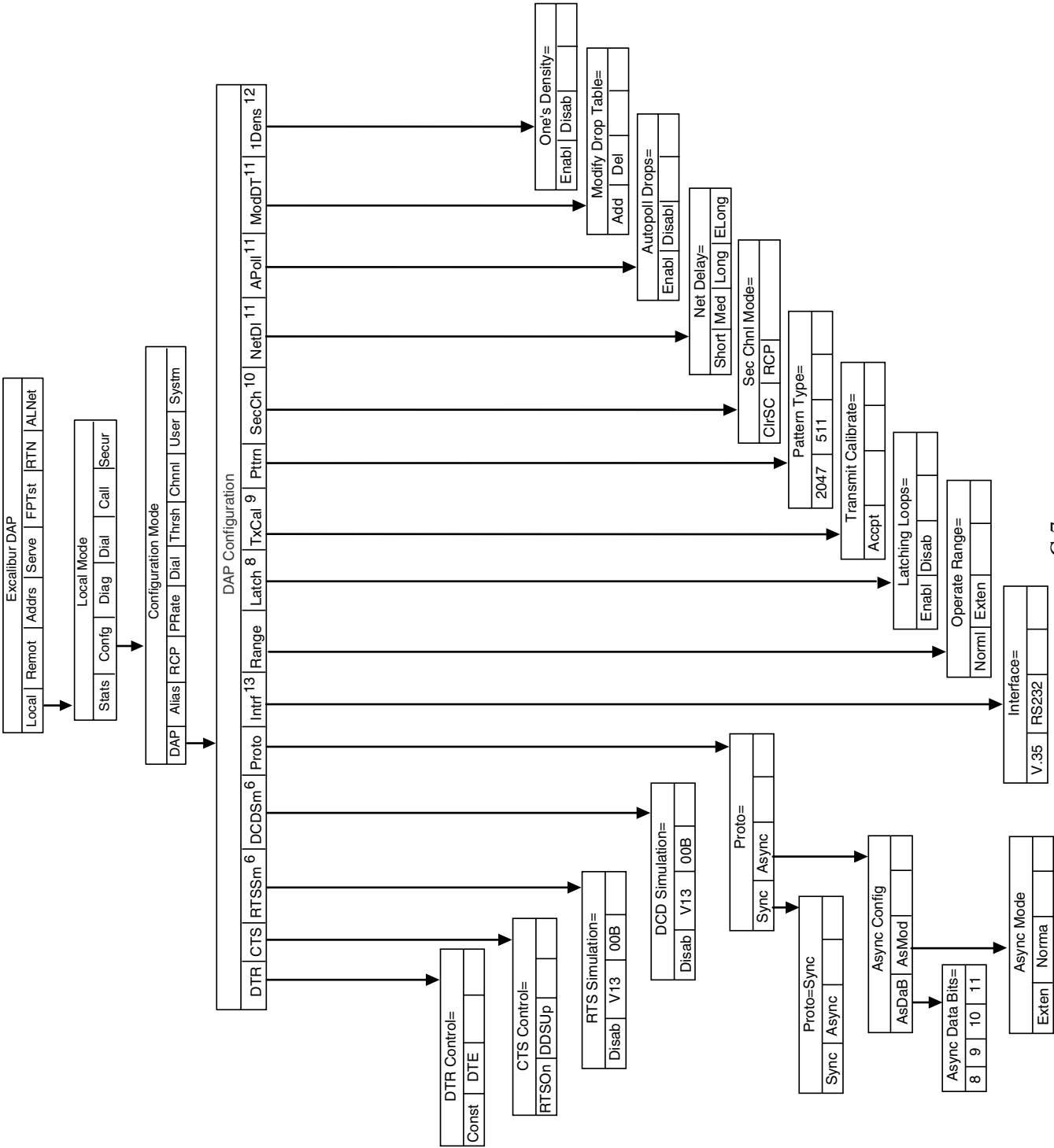
Configuration - DAP Notes

1. This parameter appears on the screen when the service is set for DDS, DDS-SC, or DDSNI. This parameter does not appear on the screen when the service is set for LADC, LDM, CC64, or C64NI. For these services, the unit defaults to point-to-point.
2. This parameter appears on the screen only when the RTS Simulation parameter is disabled.
3. This selection appears on the screen only when the service is set for LADC or LDM.
4. This parameter does not appear on the screen when the interface is V.35 or when the service is set for DDS or CC64. (The unit defaults to Signal Quality.)
5. This parameter does not appear on the screen when the interface is V.35.
6. This parameter appears on the screen only when the service is set for DDSNI, CC64, or C64NI.
7. For units equipped with the 15P09AA or Model D Aggregate card, extended range operation is automatic and this parameter does not appear on the screen. For units equipped with older Aggregate cards (Model A or C), the following conditions apply: (1) When the service is set for LADC or LDM, this parameter appears for all DTE rates. (2) When the service is set for DDS, DDSNI or DDS-SC, this parameter appears on the screen only when the DTE rate is 19.2 Kbps or greater. (3) This parameter does not appear on the screen when the service is set for CC64 or C64NI.
8. This parameter appears on the screen only when the service is set for DDS-SC or CC64.
9. This parameter appears on the screen only for units equipped with the Model A or C Aggregate card.
10. This parameter does not appear on the screen when the service is set for DDS or CC64.
11. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, and the Network parameter is set to multipoint.
12. This parameter appears on the screen only when the service is set for DDS-SC and the DTE rate is set to 56 Kbps.
13. This parameter does not appear on the screen when the unit resides in a central site card carrier. For standalone DAPs, this parameter may not appear on the screen when it is set to disabled in the Field Service menu.

Configuration - DAP



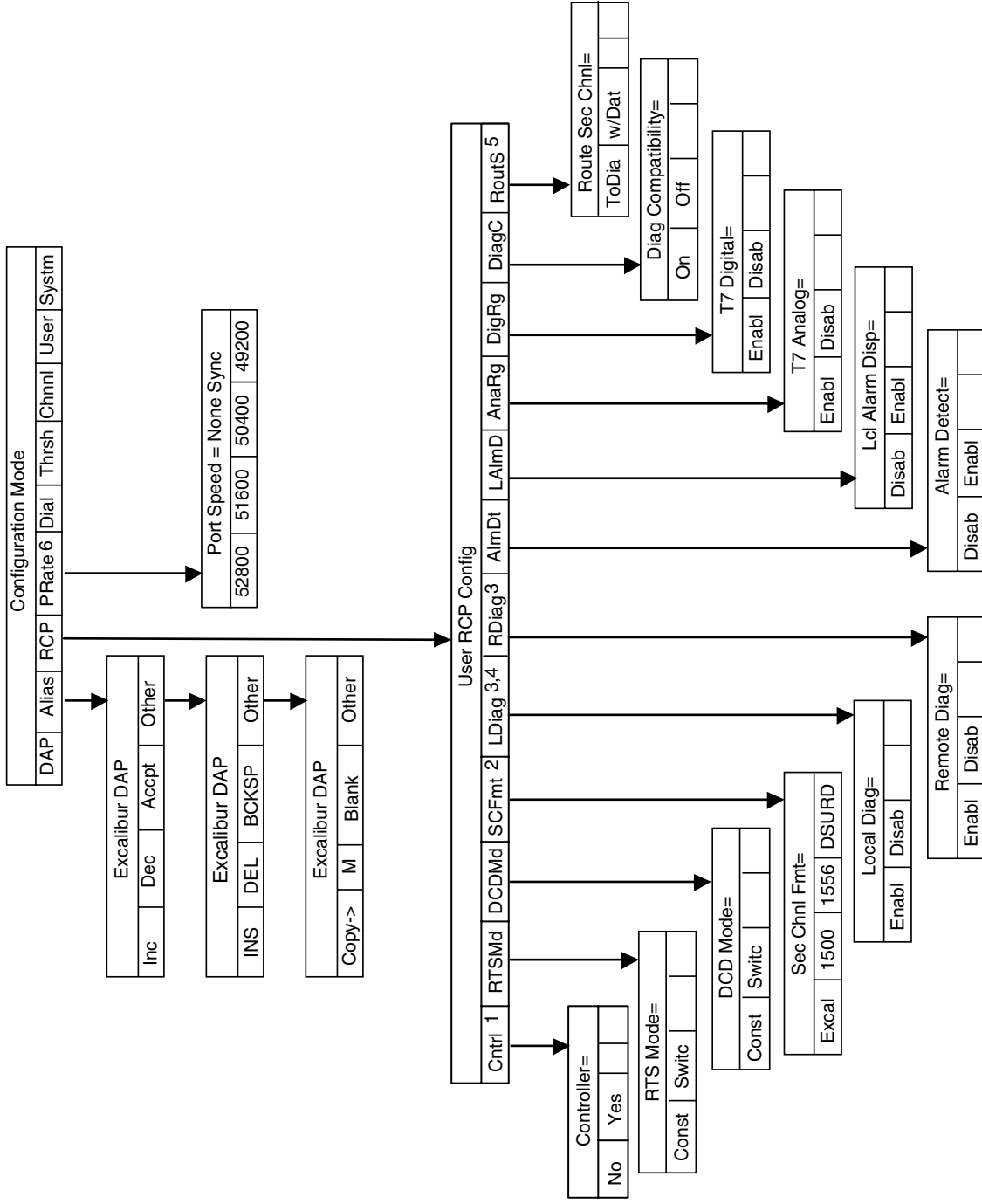
Configuration - DAP (Continued)



Configuration - Alias, RCP, and Port Rate Notes

1. This parameter does not appear on the screen when the Clear Secondary Channel parameter is enabled.
2. This parameter appears on the screen only when the service is set for DDS, DDS-SC, or LDM. It does not appear for DDS-SC or LDM when the Clear Secondary Channel parameter is enabled. The unit defaults to Excalibur.
3. This parameter appears on the screen only when the service is set for DDS.
4. This parameter does not appear on the screen if the unit is set for a remote unit in a multipoint network.
5. This parameter appears on the screen only for units equipped with the Analog or ISDN IDBU option.
6. This parameter appears on the screen only when the service is set for DDSNI or C64NI and the Multipoint Framing parameter is set to disabled. The available DTE data rates are dependent on the DDS line rate. Possible displays are:
 - (a) Synchronous - 1.2 to 52.8 Kbps in multiples of 1200 bps (except 3.6 and 6 Kbps are not provided), 56, 57.6 Kbps, and none.
 - (b) Asynchronous - 75, 150, 300, 600, 1200 bps and 1.2, 2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2, 24, 28.8, 48, 57.6 Kbps, and none.

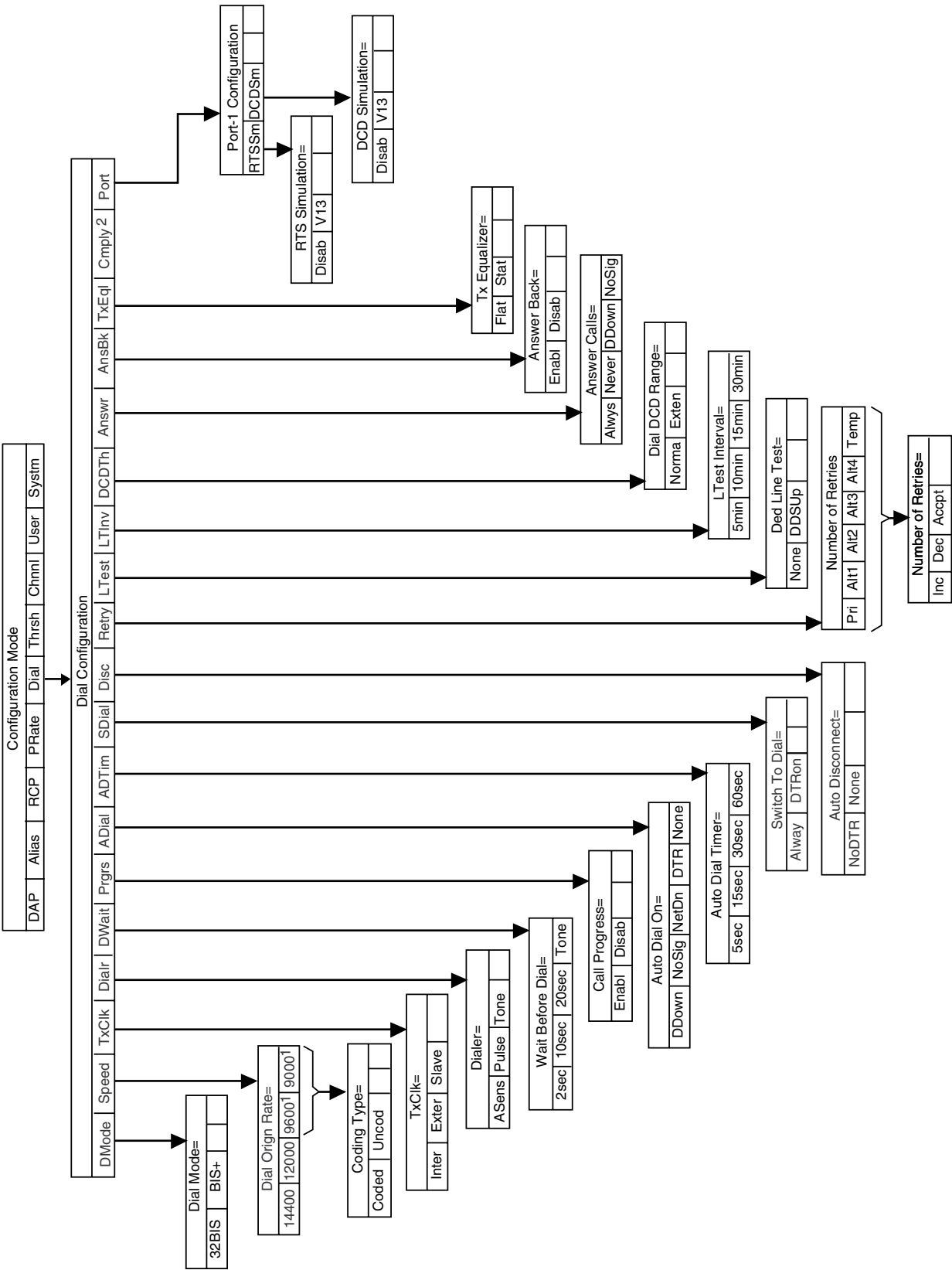
Configuration - Alias, RCP, and Port Rate



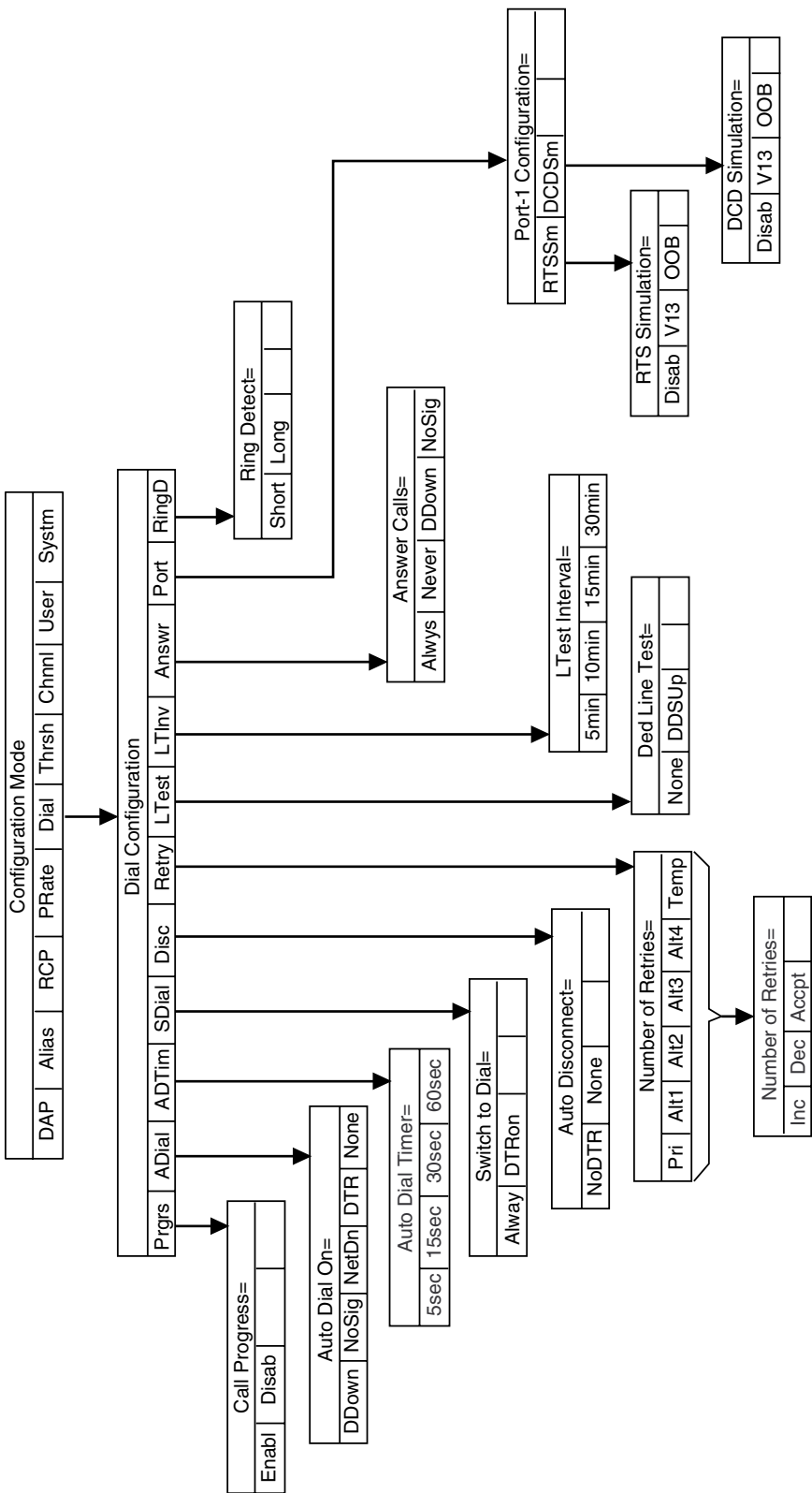
Configuration - Analog Integral Dial Backup Option Notes

1. When 9600 or 9000 is selected, you may also select Coded or Uncoded.
2. The Compliance parameter selects the mode of dial operation (Programmable or Permissive). The default setting is Permissive. To change this setting, you must enter a special password that must be obtained from your Racal service representative. The service representative will ensure that you are adhering to local compliance regulations before giving you the password.

Configuration - Analog Integral Dial Backup Option



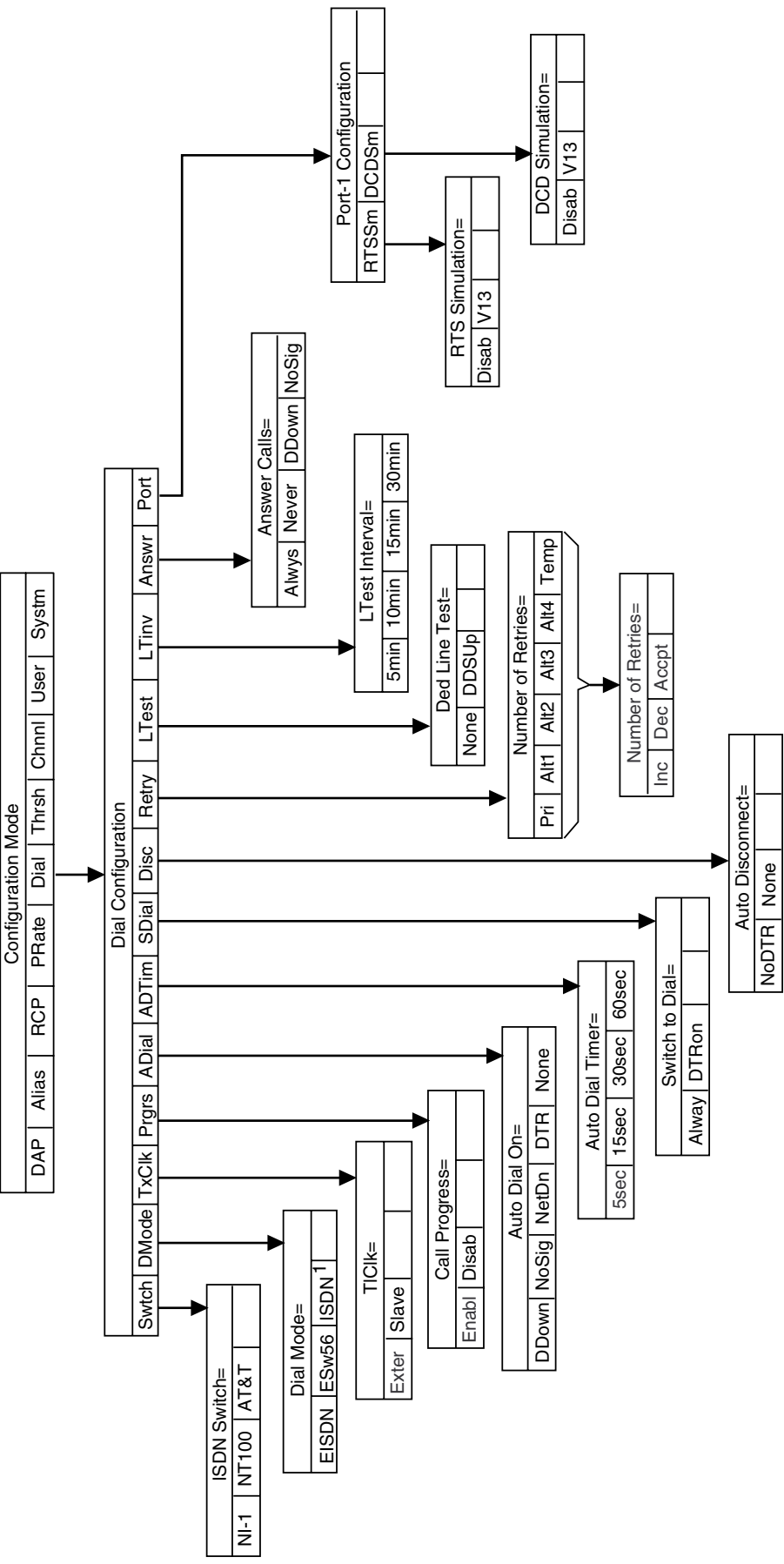
Configuration - Switched 56 Integral Dial Backup Option



Configuration - ISDN Integral Dial Backup Option Note

1. This parameter appears on the screen only when the service is set for DDS, DDS-SC, CC64, LDM, or LADC.

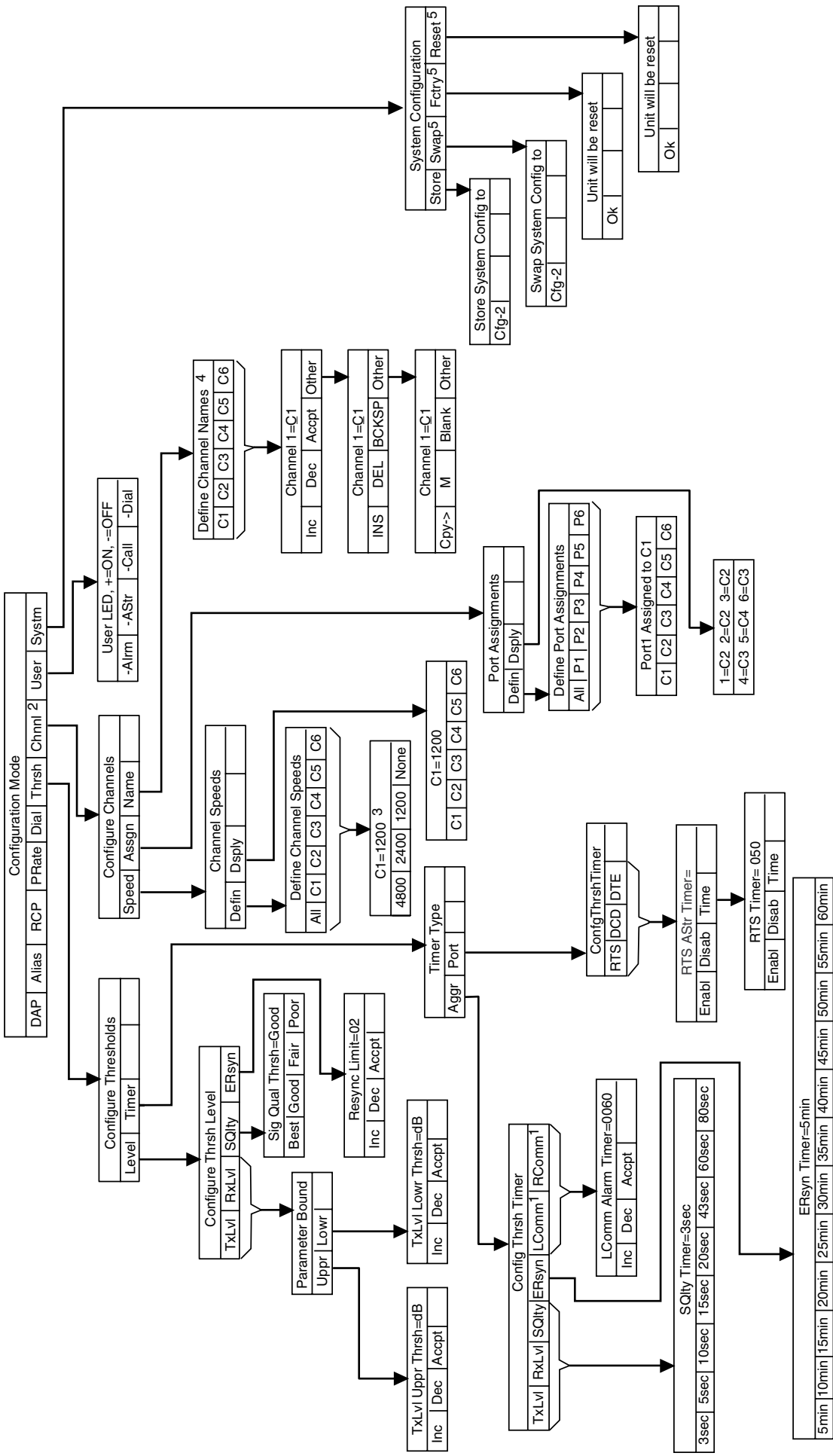
Configuration - ISDN Integral Dial Backup Option



Configuration - Line Parameter Threshold, Channel Assignment, User, and System Notes

1. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to disabled.
2. This parameter appears on the screen only when the service is set for DDSNI and the Multipoint Framing parameter is set to enabled.
3. For proper operation, all central and all remote units must have the same channel rate assignments. The possible DTE data rate options are:
 - (a) Synchronous - 1.2 to 52.8 Kbps in multiples of 1200 bps (except 3.6 and 6 Kbps are not provided) and none.
 - (b) Asynchronous - 75, 150, 300, 600 bps; 1.2, 2.4, 4.8, 7.2, 9.6, 12, 14.4, 16.8, 19.2, 24, 28.8, 48 Kbps, and none.
4. Each channel may be assigned an alphanumeric name up to five characters long.
5. Data is interrupted while the unit is reset and reinitialized.

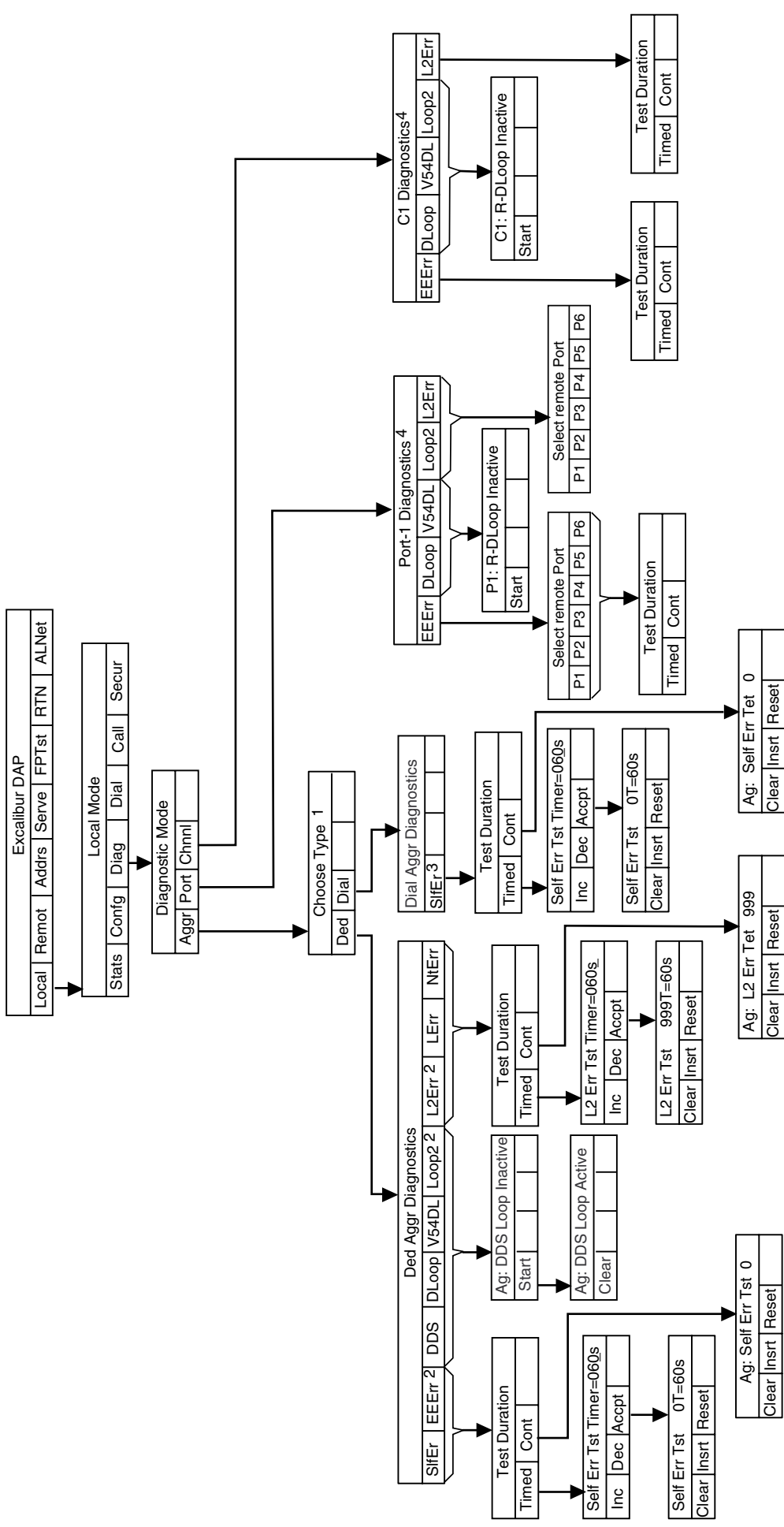
Configuration - Line Parameter Threshold, Channel Assignment, User, System



Diagnostics Notes

1. This parameter appears on the screen only for units equipped with the Analog or ISDN IDBU option. For units equipped with the Switched 56 IDBU option, when the unit is in dial backup operation, you can initiate all tests and loops provided in the Diagnostic submenu except the Self-Error Test, DDS Loop Test, Local-Error Test, and Network-Error Test.
2. The Aggregate End-to-End Error Test, Loop 2 Test, and Loop 2 Error Test are not available when the Diagnostic Compatibility parameter in the RCP submenu is set to On. These tests are available at the port or channel level.
3. This parameter appears on the screen only when the unit is in normal operation. For units equipped with the Analog IDBU option, when the unit is in dial backup operation, `EEErr` and `L2Err` appear on the screen if the Dial Mode parameter is set to BIS+ in the Dial Configuration submenu. If the Dial Mode parameter is set to 32BIS, `DLoop` appears on the screen. For units equipped with the ISDN IDBU option, when the DAP is in dial backup operation, `EEErr`, and `L2Err` appear on the screen.
4. A T precedes a port or channel if a test is already active, a V if a V.54 Digital Loop is already active, and a D if a Digital Loop is already active.

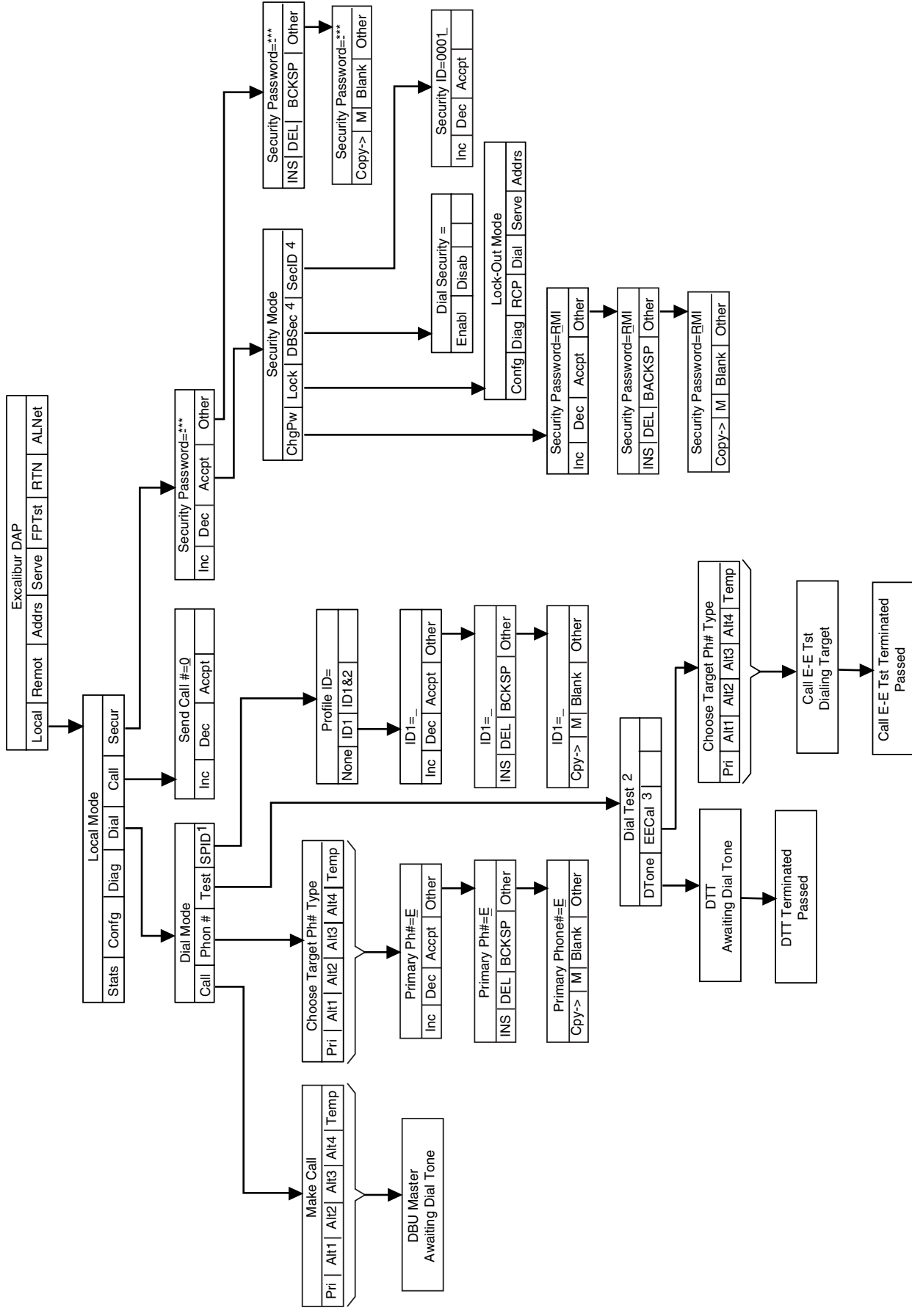
Diagnostics



Dial, Call, and Security Notes

1. This parameter appears on the screen only for units equipped with the ISDN IDBU option.
2. This parameter appears on the screen only during dedicated line operation.
3. This parameter appears on the screen only during dedicated line operation. For Analog IDBU, this parameter does not appear when the Dial Mode is set to 32Bis. For ISDN IDBU, this parameter appears when the Dial Mode is set to ESw56, but if you try to activate the test, the screen displays the message: Error Invalid Configuration.
4. DBSec and SecID appear on the screen only for units equipped with the Analog or ISDN IDBU feature. They are applicable only when the Dial Mode is set to BIS+ for Analog IDBU or to EISDN for ISDN IDBU.

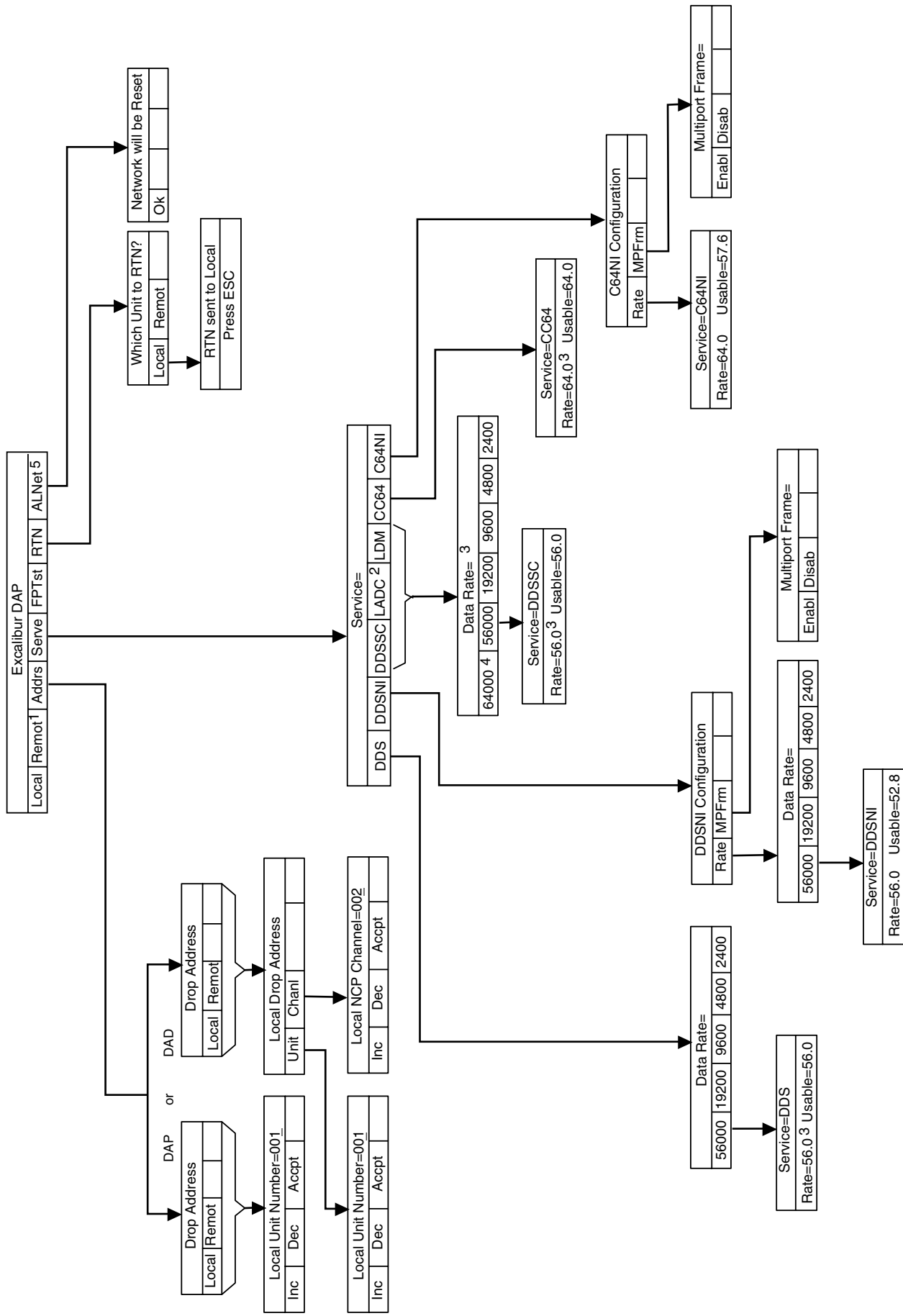
Dial, Call, Security



Address, Service, RTN, and ALNet Notes

1. The Remote menu does not appear on the screen when any of the following parameters are set:
 - (a) The service parameter is set to CC64.
 - (b) The Controllor parameter is set to No in the RCP Configuration submenu.
 - (c) The Secondary Channel Format parameter is set to anything other than Excal.
 - (d) The Service parameter is set to DDS and the Local Diagnostics parameter is set to Disabled.
 - (e) The Service parameter is set to DDSNI, DDS-SC, LADC, LDM, or C64NI, and the Secondary Channel Mode parameter is set to ClrSC.
2. LADC does not appear on the screen for units equipped with the Model D Aggregate card.
3. For all services except DDSNI and C64NI, the line rate will equal the usable DTE rate.
4. This rate appears on the screen only when the service is set for LADC or LDM.
5. This parameter appears on the screen only when the service is set for DDSNI, the Location parameter is set to central, the Network parameter is set to multipoint, and the Automatic Poll parameter is set to enabled.

Address, Service, RTN, ALNet



Appendix D

Regulatory Information

FCC Part 15: Radio/Television Interference

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Changes or modifications to this equipment not expressly approved by Milgo Solutions can void the user's authority to operate this equipment.

For FCC CFR 47 Part 15 compliance, a ferrite collar must be placed on certain interconnecting cables. This collar is provided with the product. The installation instructions in this manual explain how to properly attach this collar to the cable.

Special Notice

The instructions in this manual involving actions with the device and requiring a tool* for access, must be performed only by qualified service personnel.

- * A tool is defined as any implement used to facilitate a mechanical operation, such as operating a fastener or similar fixing device.

Chaque fois que le manuel d'instructions recommande d'utiliser un outil* pour effectuer une opération à l'intérieur du dispositif, cette opération doit absolument être confiée à un personnel de service qualifié.

- * Un outil est défini tout dispositif utilisé pour faciliter une opération mécanique, p.ex., le fonctionnement d'un organe de fixation ou autre dispositif semblable.

Notice to Canadian Users

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le règlement sur le brouillage Radioélectrique édicté par le Industrie Canada.

Power Requirements

For use with a CSA certified/UL listed power supply, with NEC Class 2 output(s): rated output +5 VDC, 1.5 A; +12 VDC, 0.25 A; -12 VDC, 0.50 A.

Pour utiliser avec une alimentation CSA certifiée dotée de sortie de Classe 2 avec caractéristiques nominales de sortie +5 VDC, 1.5 A; +12 VDC, 0.25 A; -12 VDC, 0.50 A.

FCC Part 68: Requirements For End Users

This equipment complies with Part 68 of the FCC regulations. On the bottom of the unit is an equipment label that contains, among other information, the FCC registration number (AP3USA-61274-DD-N) and Ringer Equivalence Number (REN) which is 0.2B for the Analog IDBU. If requested, provide this information to your telephone company.

The REN is useful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your number is called. In most but not all areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, call your local telephone company to determine the maximum REN for your calling area.

Before connecting your unit to the lines, you must inform your local telephone company of the jack (connector), Facility Interface Code (FIC), and Service Order Code (SOC) required for your unit, as follows:

<u>Operation</u>	<u>Jack</u>	<u>FIC</u>	<u>SOC</u>
Permissive	RJ11C	02LS2	9.0Y
Programmable*	RJ45S	02LS2	9.0Y

* (See "Program Resistor," page 5-44, for important instructions.)

The following are the associated private line port, jack, FIC, and SOC, for digital line and LADC connections:

<u>Port</u>	<u>Jack</u>	<u>FIC</u>	<u>SOC</u>
2.4 Kbps	RJ48S	04DU5-24	6.0F
4.8 Kbps	RJ48S	04DU5-48	6.0F
9.6 Kbps	RJ48S	04DU5-96	6.0F
56 Kbps	RJ48S	04DU5-56	6.0F
LADC	RJ48S	LADC	7.0Y

NOTICE

Connection of equipment configured for Local Area Data Channel (LADC) operation to Digital Data Service (DDS-1) telephone lines or connection of equipment configured for Digital Data Service (DDS-1) to Local Area Data Channel (LADC) telephone lines is prohibited by Federal Communications Commission Rules.

The Integrated Services Digital Network (ISDN) and Switched 56 Kbps DDS Service are outside the scope of the FCC Part 68 Rules for Equipment Registration. This equipment complies with the technical requirements of Subpart "D" of Part 68 of the FCC regulations.

The Switched 56 IDBU Service is offered under special telephone tariffs from your local telephone company. Contact the telephone company to obtain the connection information required for your unit.

Note that some types of analog private line connections may require the filing of a signal power affidavit with the telephone company, and some types of digital installations may require the filing of an "Encoded Analog Content and Billing Protection" affidavit.

This unit cannot be used on the public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission or corporation for further information.)

If the unit causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, you will be notified in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

All repairs on your unit must be performed by the Milgo Solutions company that manufactured the unit or by an authorized representative of that company. For service information contact the appropriate Customer Support Office nearest you. The office(s) are listed in the front of this manual.

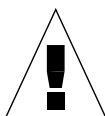
Industry Canada: Requirements for End Users

Notice: Industry Canada identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe systems, if present, are connected together. This precaution may be particularly important in rural areas.



Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5..

Repairs: Inquiries regarding Canadian repair centers should be addressed to the Milgo Solutions company that manufactured your unit or by an authorized representative of that company. For Canadian service information, contact the appropriate Customer Support Office nearest you. Contact information is listed in the front of this manual.

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We want your feedback.

To better serve our customers, Milgo Solutions welcomes your comments concerning this manual. Please take the time to fill out the following questionnaire, remove it from your manual, and drop it in the mail or FAX it to us at (954) 846-3244. We also welcome your comments via e-mail at address *techdoc@milgo.com*.

Name of Manual/Document No./Date:

Excalibur Multirate DAP Installation and Operation 15D09B-1/D 6/95

Was the information in this manual presented in a logical order?

_____ Excellent _____ Good _____ Fair _____ Poor

How easy was it to locate specific information?

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Rate the technical level of information presented in this manual:

_____ Too technical _____ Suitable technical level _____ Not technical enough

Are technical terms clearly defined?

_____ Excellent _____ Good _____ Fair _____ Poor

Rate the quality of the illustrations:

_____ Excellent _____ Good _____ Fair _____ Poor

Are the manual's instructions clearly written?

_____ Excellent _____ Good _____ Fair _____ Poor

Rate the quantity of the illustrations in this manual:

_____ Too many _____ Suitable amount _____ Not enough

Does this manual contain all the information you require? (Y/N)

If not, what would you suggest we add to make the manual more useful?

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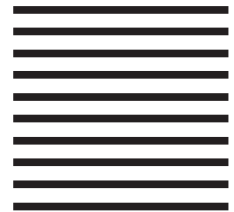
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